

September 11, 2017

**MEMORANDUM TO:** Deanna Riffey, Environmental Program Consultant

Environmental Analysis Unit, NCDOT

**FROM:** Sara Easterly, Senior Environmental Scientist

HDR

**SUBJECT:** Jurisdictional Resources and Protected Species Review of

Access Roads for Complete 540, Wake and Johnston Counties, Divisions 5 and 6, TIPs. R-2721, R-2828, and

R-2829

HDR Engineering, Inc. of the Carolinas (HDR) has completed an environmental review of access roads for the Complete 540 – Triangle Expressway Southeast Extension project in Wake and Johnston Counties. The Complete 540 improvements include the extension of the Triangle Expressway from NC 55 Bypass in Apex to the US64/US 264 Bypass in Knightdale. All the access road study areas (study areas) presented within this memorandum were located within Wake County. HDR reviewed the study areas on August 14, 15, and 16, 2017 for threatened and endangered species under Section 7 of the Endangered Species Act and for jurisdictional wetlands and streams using the methodology outlined in the 1987 US Army Corps of Engineers Wetland Delineation Manual and the 2010 Eastern Mountains and Piedmont Regional Supplement. The following tables and discussion illustrate the findings.

#### WATER RESOURCES

Water resources in the study areas are part of the Neuse and Cape Fear River basins [United States Geological Survey (USGS) Hydrologic Units 03020201 and 03030004]. Eleven streams were identified in the study areas (Table 1). The locations of these water resources are shown on the attached figures. The physical characteristics of these streams are provided in Table 2 and jurisdictional characteristics are in Table 3. Seven streams were extended from previous delineations captured in the 2014 Natural Resources Technical Report (NRTR) by Mulkey Engineers and four new streams were added. Note that previous stream forms for streams that had to be extended were field verified.

Table 1. Water resources in the study areas

Stream Name	Map ID	NCDWQ Index Number	Best Usage Classification
Big Branch*	Big Branch	18-7-6-1	С
Middle Creek	SO	27-43-15-(1)	C;NSW
UT to Little Branch	SE	18-7-6-1-1	С
UT to Rocky Branch	SAB	27-43-15-4.5	C;NSW
UT Bells Lake	SAR	27-43-15-6	C;NSW
UT to Mills Branch	SBJ	27-43-15-7	C;NSW
UT to Swift Creek	SFJ	27-43-(8)	C;NSW
UT to Neuse River	SHC	27-(22.5)	C;NSW
UT to Little Branch*	SSF	18-7-6-1-1	С
UT to Middle Creek*	SSH	27-43-15-(1)	C;NSW
UT to Mills Branch*	SSI	27-43-15-7	C;NSW

<sup>\*</sup> New streams found during review

Table 2. Physical characteristics of water resources in the study areas

Map ID	Bank Height (ft)	Bankful Width (ft)	Water Depth (in)	Channel Substrate	Velocity	Clarity
Big Branch	1-2	2-8	2-18	Sa, Gr, Si	Moderate	Clear
SO	4	15-20	4-18	Sa, Si, Gr	Moderate	Slightly Turbid
SE	1-2	2-5	1-12	Sa, Si, Gr, Co, Bd	Slow	Clear
SAB	2-3	4	0	Gr, Co, Sa	NA	NA
SAR	2-4	8	0	Sa, Gr, Co	NA	NA
SBJ	1-3	4-6	4-18	Sa, Gr, Si	Moderate	Slightly Turbid

Table 2. Physical characteristics of water resources in the study areas (Cont.)

Map ID	Bank Height (ft)	Bankful Width (ft)	Water Depth (in)	Channel Substrate	Velocity	Clarity
SFJ	8-10	5-7	2	Sa, Gr	Slow	Clear
SHC	6	8-10	2-6	Sa, Gr	Moderate	Clear
SSF	2-4	12	2-18	Si, Sa	Slow	Slightly Turbid
SSH	4	4	1-3	Gr, Si, Sa	Slow	Clear
SSI	6-12	4	2-12	Sa, Gr, Si	Moderate	Slightly Turbid

Totes: Bd=Bedrock, Gr=Gravel, Sa=Sand, Si=Silt, Co=Cobble

NA = stream had no flow during review

Table 3. Jurisdictional characteristics of water resources in the study areas

Map ID	Length (ft.)	Classification	Compensatory Mitigation Required	River Basin Buffer
Big Branch	156	Perennial	Yes	Subject
SO	93	Perennial	Yes	Subject
SE	469	Intermittent	Yes	Subject
SAB	173	Ephemeral*	Yes	Subject
SAR	230	Intermittent	Yes	Subject
SBJ	63	Perennial	Yes	Subject
SFJ	20	Intermittent	Yes	Subject
SHC	178	Perennial	Yes	Subject
SSF	460	Perennial	Yes	Subject
SSH	72	Intermittent	Yes	Subject
SSI	85	Intermittent	Yes	Subject
Total	1,999			

<sup>\*</sup> Previously delineated as Perennial and approved by the USACE. It will need confirmation by the USACE for status change.

One pond is located within the study areas (Figure 15). This pond consists of an artificially excavated pit that is sustained by high groundwater levels. Approximately 0.09 acre of the pond is located within the study area. The total area of the pond is 0.67 acre.

No High Quality Waters (HQW), Outstanding Resource Waters (ORW), or water supply watersheds (WS-I or WS-II) waters occur within 1.0 mile of the study areas. Additionally, no streams within the study areas support trout or anadromous fish and no Primary Nursing Areas are present. No streams within 1.0 mile downstream of the study areas were identified on the North Carolina 2014 Final 303(d) list of impaired waters.

No benthic samples have been conducted within 1.0 mile of the study areas. No fish surveys have been conducted within 1.0 mile of the study areas.

# **JURISDICTIONAL WETLANDS**

Fifteen jurisdictional wetlands were identified within the study areas and are shown on the attached figures. Wetland classification and quality rating data are presented in Table 4. Five wetlands were extended from previous delineations captured in the 2014 NRTR by Mulkey Engineers and ten new wetlands were added. Note that previous wetland delineation forms for wetlands that had to be extended were field verified.

Table 4. Jurisdictional characteristics of wetlands in the study areas

Map ID	NCWAM Classification	Hydrologic Classification	Area (ac.)
WR	Bottomland Hardwood Forest	Riparian	0.12
WS	Bottomland Hardwood Forest	Riparian	0.30
WBC	Bottomland Hardwood Forest	Riparian	0.44
WBZ	Bottomland Hardwood Forest	Riparian	0.08
WDE	Bottomland Hardwood Forest	Riparian	0.09
WVX*	Headwater Forest	Non-Riparian	0.10
WVZ*	Headwater Forest	Non-Riparian	0.05
WWB*	Non-Tidal Freshwater Marsh	Non-Riparian	0.01
WWC*	Seep	Non-Riparian	0.01
WWD*	Non-Tidal Freshwater Marsh	Riparian	0.76
WWE*	Headwater Forest	Non-Riparian	< 0.01

Table 4. Jurisdictional characteristics of wetlands in the study areas (Cont.)

Map ID	NCWAM Classification	Hydrologic Classification	Area (ac.)
WWF*	Bottomland Hardwood Forest	Riparian	0.05
WWG*	Headwater Forest	Riparian	0.03
WWH*	Bottomland Hardwood Forest	Riparian	0.16
WWI*	Bottomland Hardwood Forest	Riparian	0.49
* New wetlands found during review.		Total	2.70

# FEDERALLY PROTECTED SPECIES

As of July 10, 2017, the United States Fish and Wildlife Service (USFWS) lists four federally protected species for Wake County (Table 5). A brief description of the species' habitat requirements follows along with the Biological Conclusion rendered based on survey results in the study areas.

Table 5. Federally protected species listed for Wake County

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
Picoides borealis	Red-cockaded woodpecker	Е	No	No Effect
Alasmidonta heterodon	Dwarf wedgemussel	Е	Yes	May Affect, Likely to Adversely Affect
Rhus michauxii	Michaux's sumac	Е	Yes	No Effect

E - Endangered

# Red-cockaded woodpecker

USFWS Recommended Survey Window: year round; November-early March (optimal)

Habitat Requirements: The red-cockaded woodpecker (RCW) occupies open, mature stands of southern pines, particularly longleaf pine, for foraging and nesting habitat. The RCW typically nests in pine trees that are >60 years old, and which are contiguous with pine stands at least 30 years of age to provide foraging habitat. The foraging range of the RCW is normally no more than 0.5 miles.

Biological Conclusion: No Effect

T - Threatened

TBD - To be determined

No suitable foraging or nesting habitat was present in the study areas. Based on these findings, the biological conclusion within the study areas is that the proposed project would have no effect on red-cockaded woodpecker.

#### **Dwarf wedgemussel**

USFWS Recommended Survey Window: year round

Habitat Description: In North Carolina, the dwarf wedgemussel is known from the Neuse and Tar River drainages. The mussel inhabits creek and river areas with a slow to moderate current and sand, gravel, or firm silt bottoms. Water in these areas must be well oxygenated. Stream banks in these areas are generally stable with extensive root systems holding soils in place.

Biological Conclusion: May Affect, Likely to Adversely Affect

A thorough description of the habitat assessment and survey results for the dwarf wedgemussel were provided in a September 2017 draft biological assessment along with the rational for the biological conclusion. The Complete 540 project is expected to result in unavoidable adverse impacts to the dwarf wedgemussel. This draft biological assessment was submitted to the USFWS on September 6, 2017.

#### Michaux's sumac

USFWS Optimal Survey Window: May-October

Habitat Description: Michaux's sumac, endemic to the inner Coastal Plain and lower Piedmont, grows in sandy or rocky, open, upland woods on acidic or circumneutral, well-drained sands or sandy loam soils with low cation exchange capacities. The species is also found on sandy or submesic loamy swales and depressions in the fall line Sandhills region as well as in openings along the rim of Carolina bays; maintained railroad, roadside, power line, and utility rights-of-way; areas where forest canopies have been opened up by blowdowns and/or storm damage; small wildlife food plots; abandoned building sites; under sparse to moderately dense pine or pine/hardwood canopies; and in and along edges of other artificially maintained clearings undergoing natural succession. In the central Piedmont, it occurs on clayey soils derived from mafic rocks. The plant is shade intolerant and, therefore, grows best where disturbance (*e.g.*, mowing, clearing, grazing, and periodic fire) maintains its open habitat.

#### Biological Conclusion: No Effect

Suitable habitat for Michaux's sumac is present within the study areas along roadside shoulders and edges of maintained open areas. HDR biologists conducted surveys for Michaux's sumac within the study areas on August 14, 15, and 16, 2017. No individuals of the species were found during the surveys. A review of North Carolina Natural Heritage Program (NCNHP) records, updated June 2017,

indicated no element occurrences within 1.0 mile of the study areas. Based on this information, no effects to Michaux's sumac would occur within the study areas.

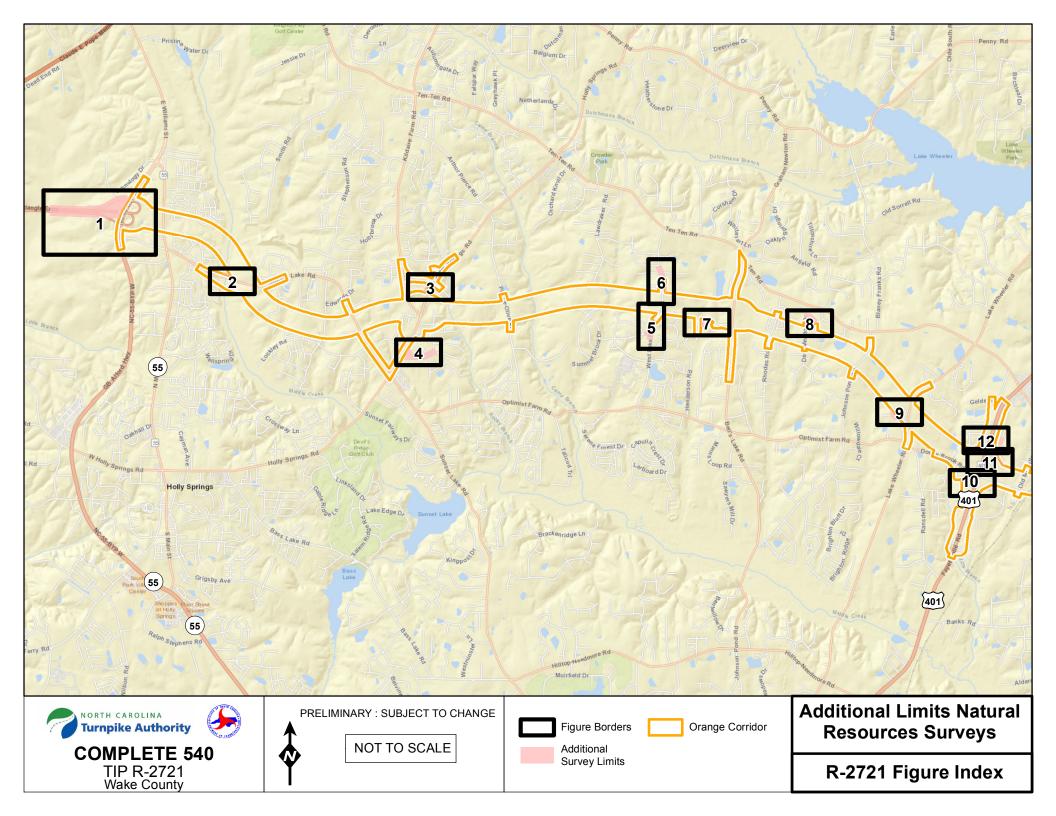
#### Northern long-eared bat

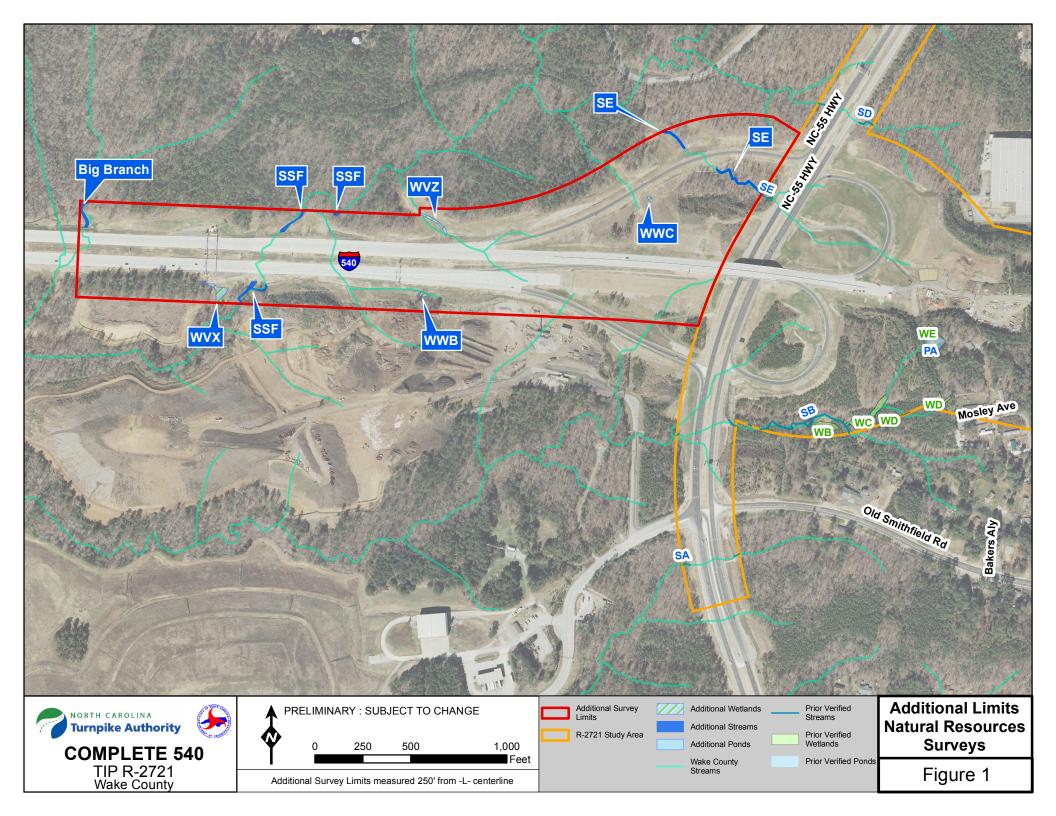
The US Fish and Wildlife Service developed a programmatic biological opinion (PBO) in conjunction with the Federal Highway Administration (FHWA), the US Army Corps of Engineers (USACE), and NCDOT for the northern long-eared bat (NLEB) in eastern North Carolina. The PBO covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities. The programmatic determination for NLEB for the NCDOT program is "May Affect, Likely to Adversely Affect". The PBO provides incidental take coverage for NLEB and will ensure compliance with Section 7 of the Endangered Species Act for five years for all NCDOT projects with a federal nexus in Divisions 1-8, which includes Wake County.

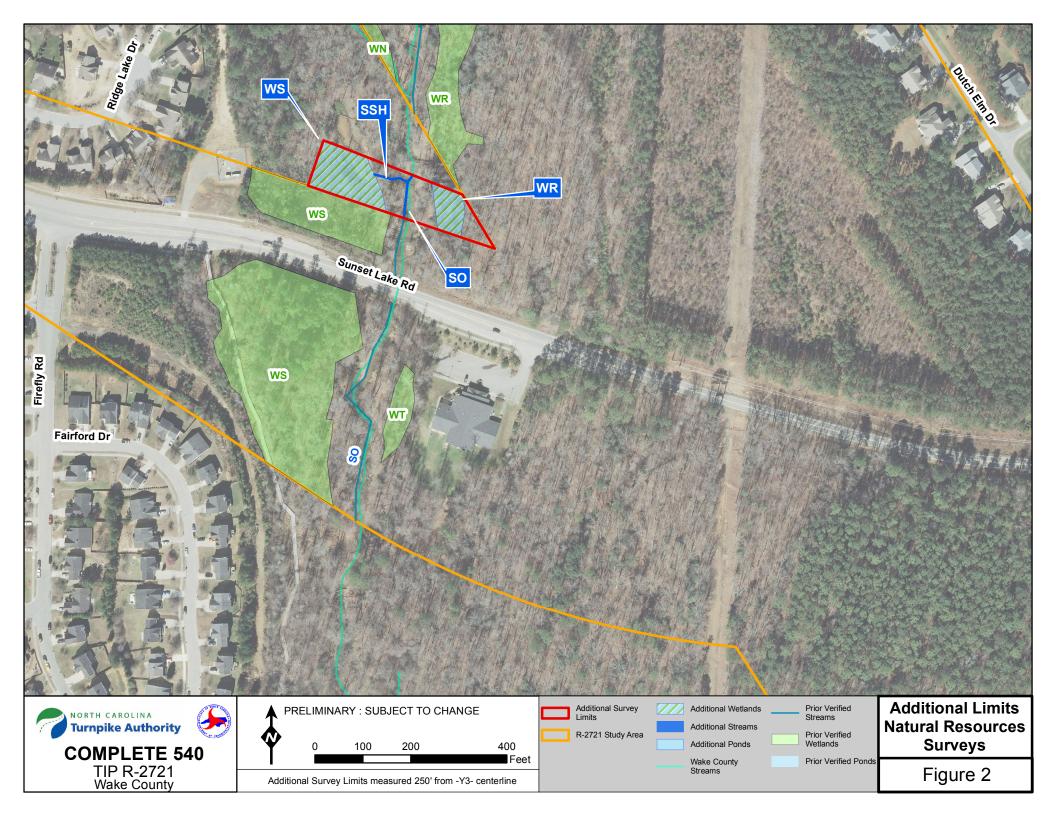
## **Bald Eagle and Golden Eagle Protection Act**

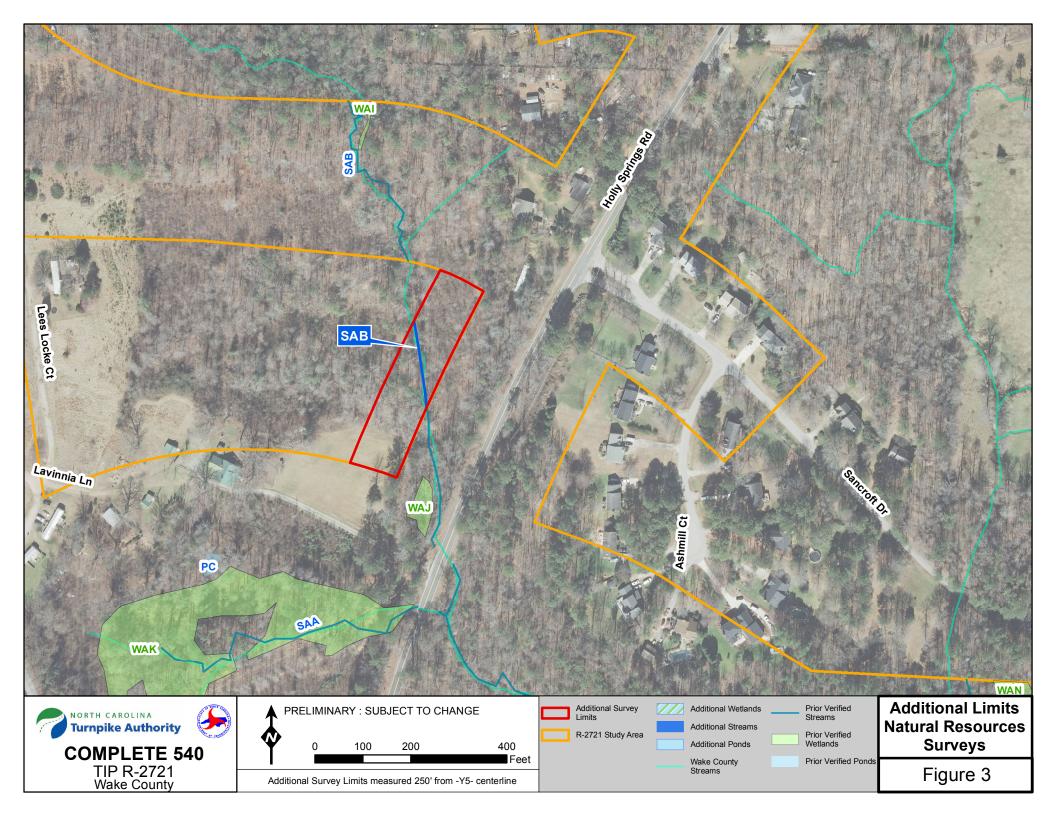
Habitat for the American bald eagle primarily consists of mature forest in proximity to large bodies of open water for foraging. Large dominant trees are utilized for nesting sites, typically within 1.0 mile of open water.

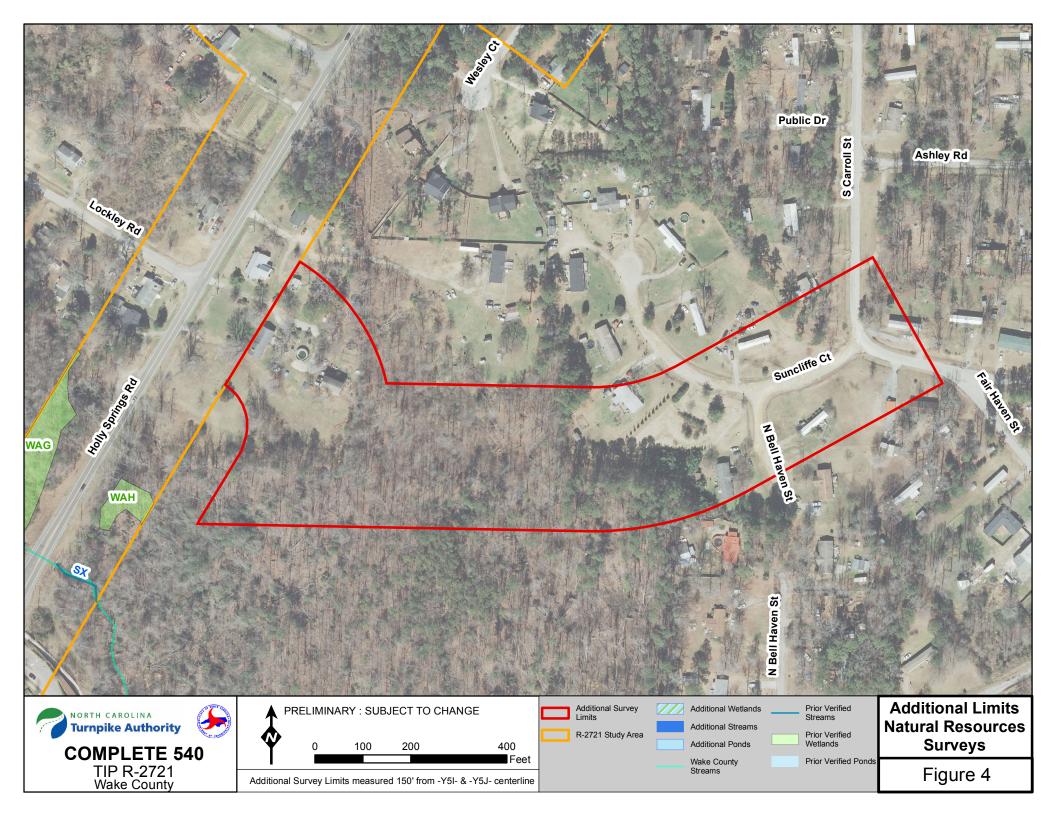
No water bodies large enough or sufficiently open to be considered potential foraging sources were identified within the study areas. Since there was no foraging habitat within the study areas, a survey of the study areas and the area within 660 feet of them was not conducted. Additionally, a review of the NCNHP database revealed no known occurrences of this species within 1.0 mile of the study areas. Due to the lack of nesting and known occurrences it has been determined that proposed construction within the study areas will not affect this species.

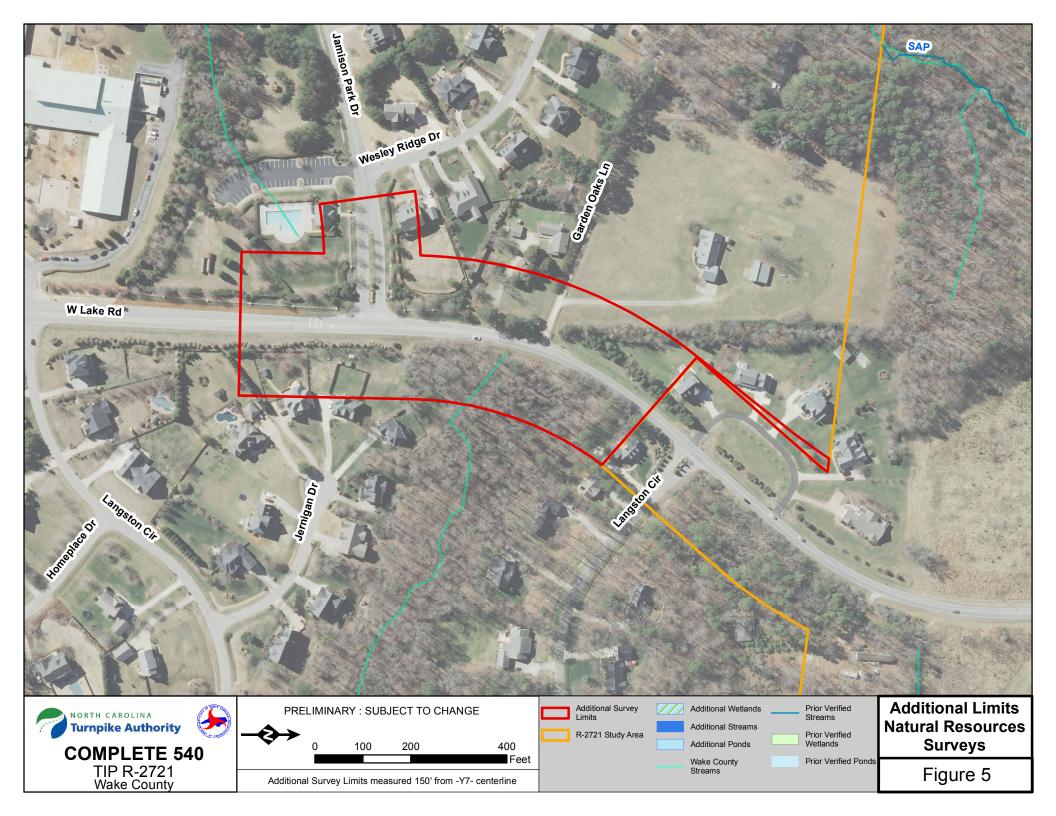


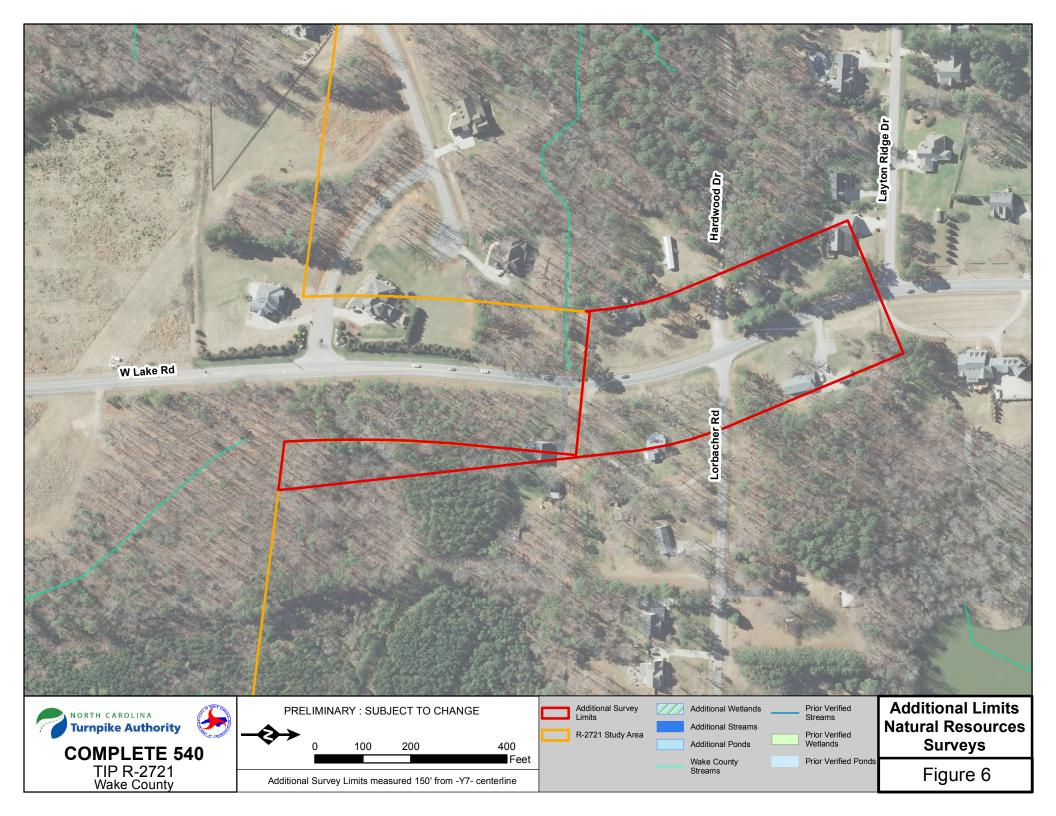


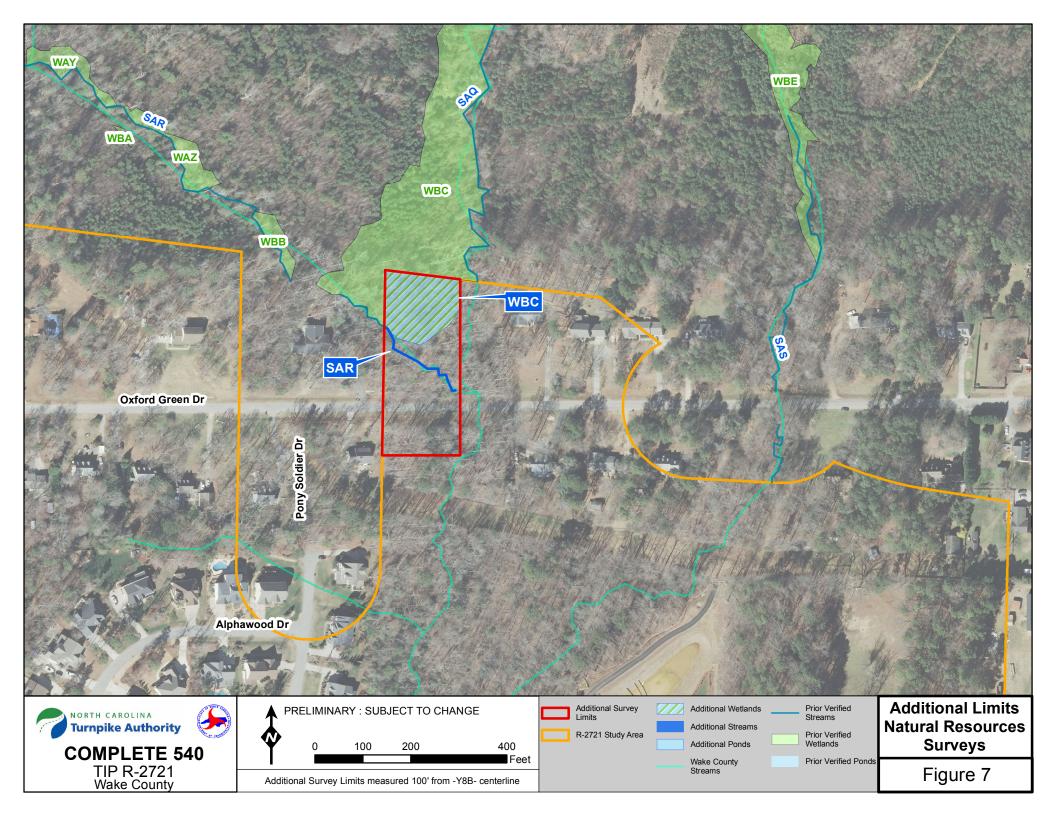


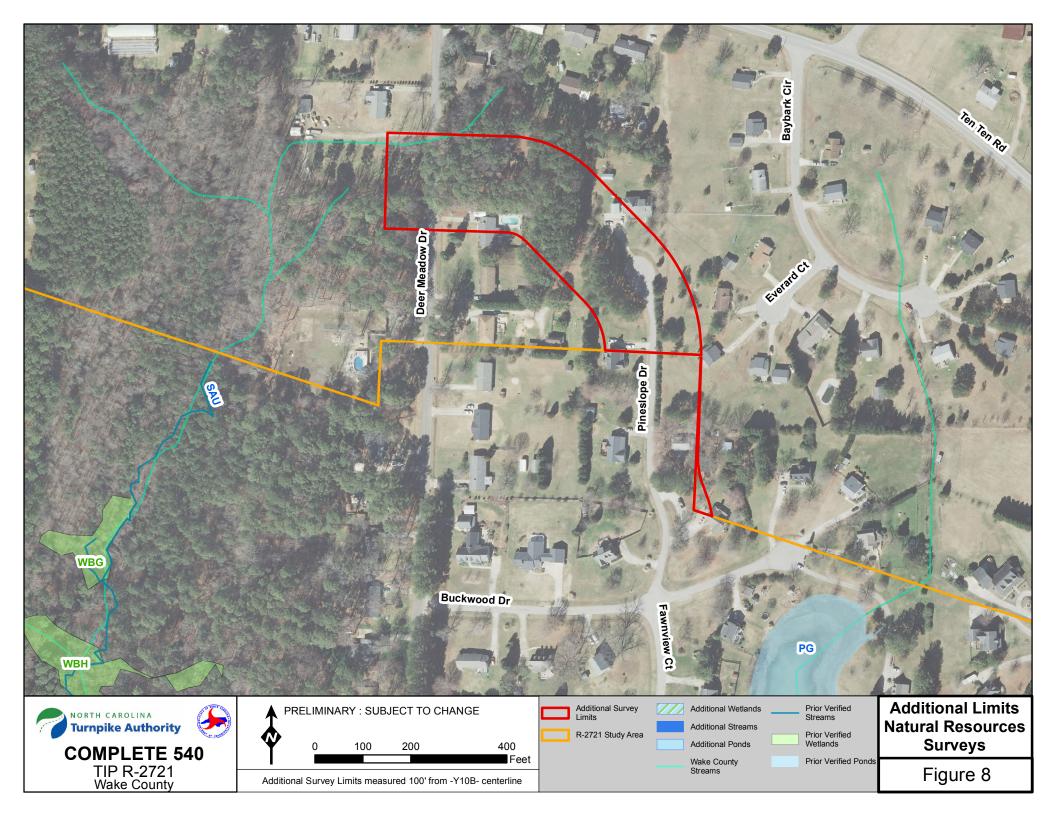


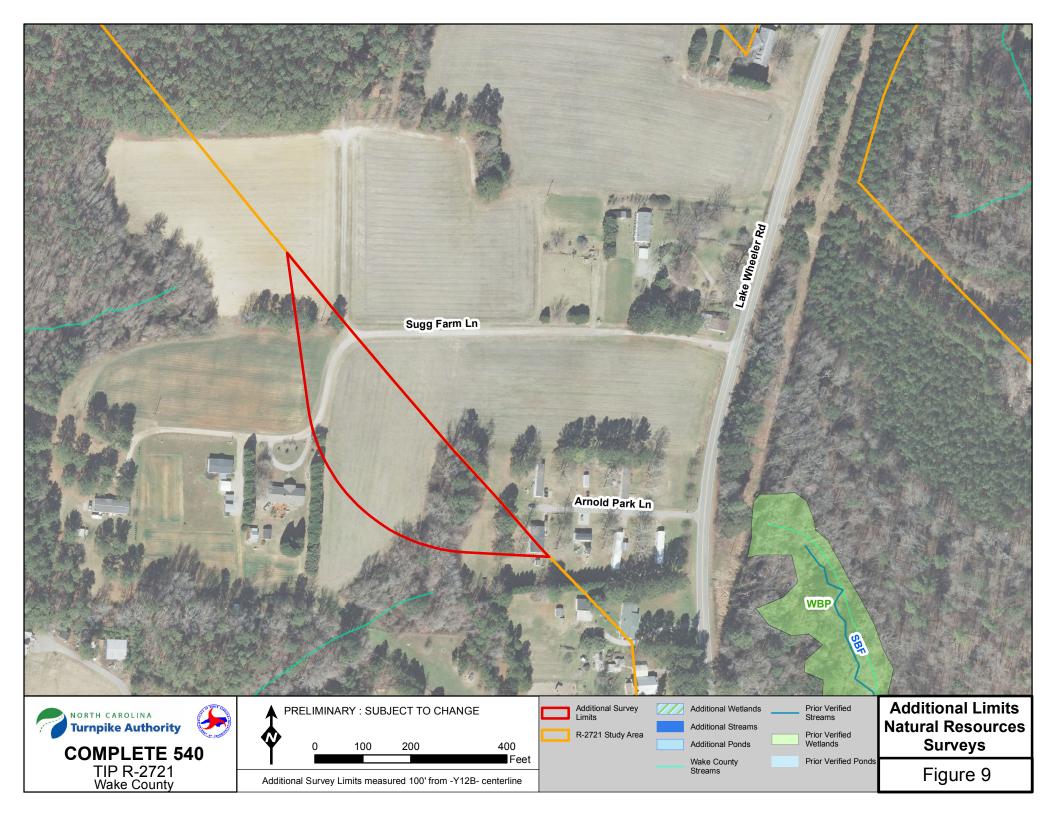


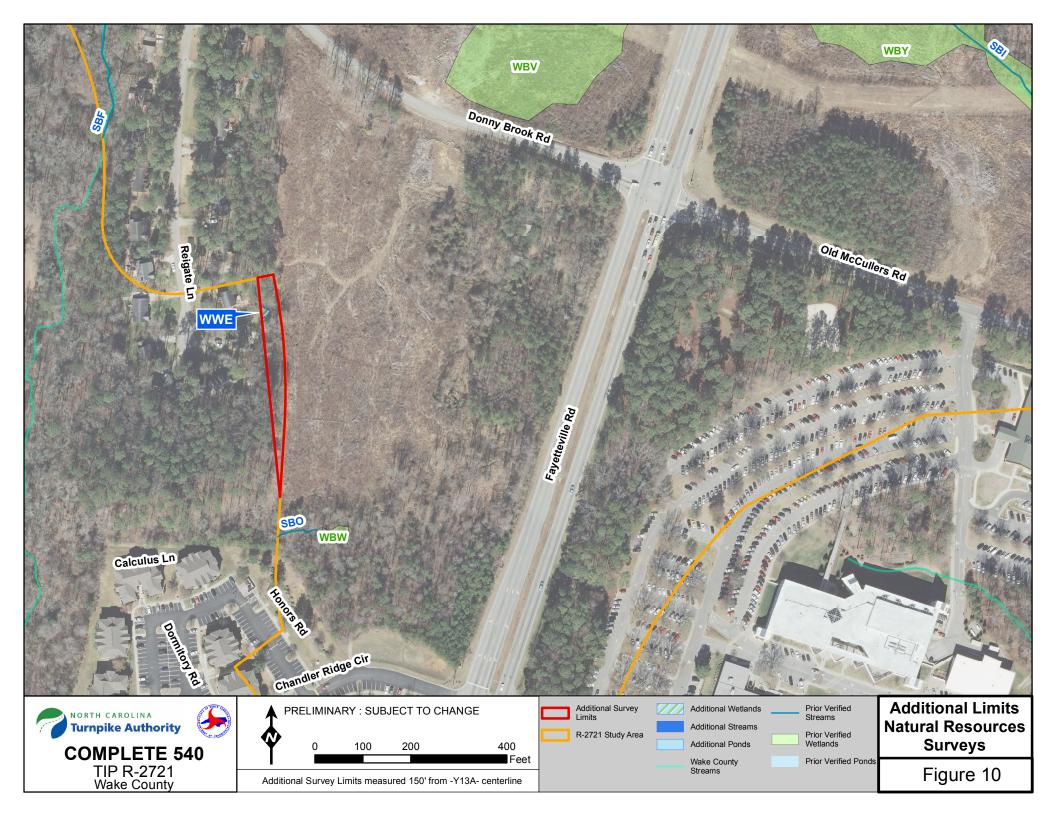


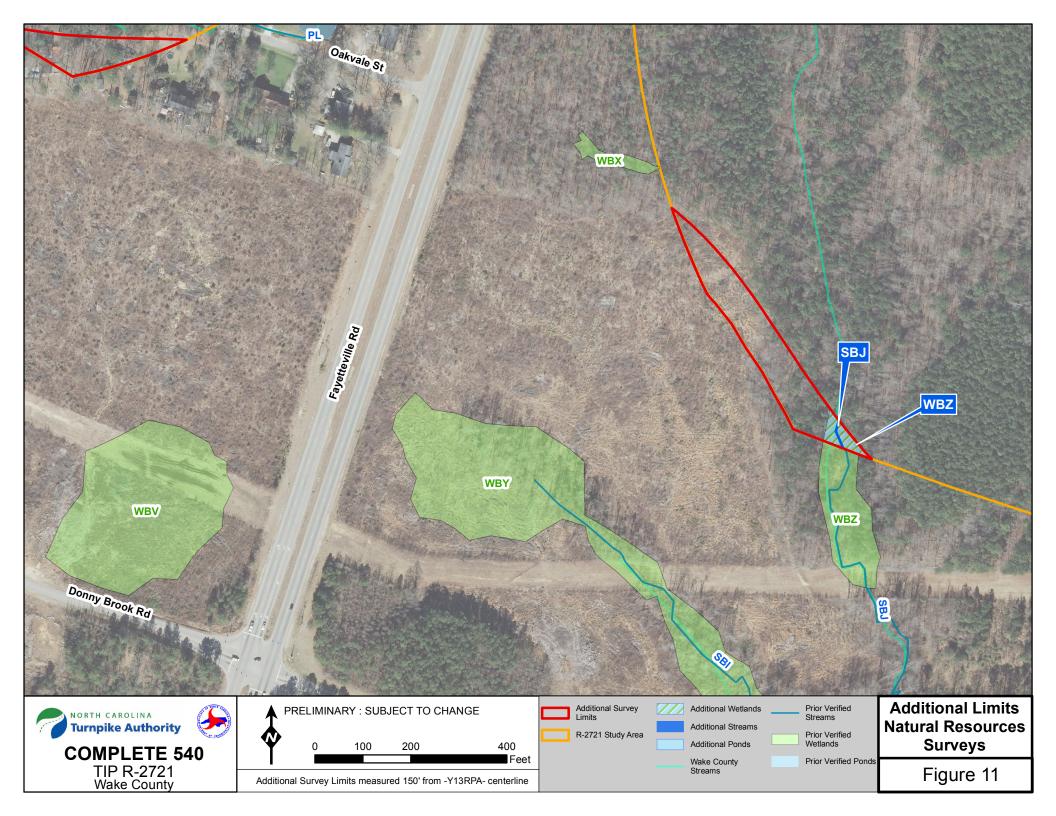


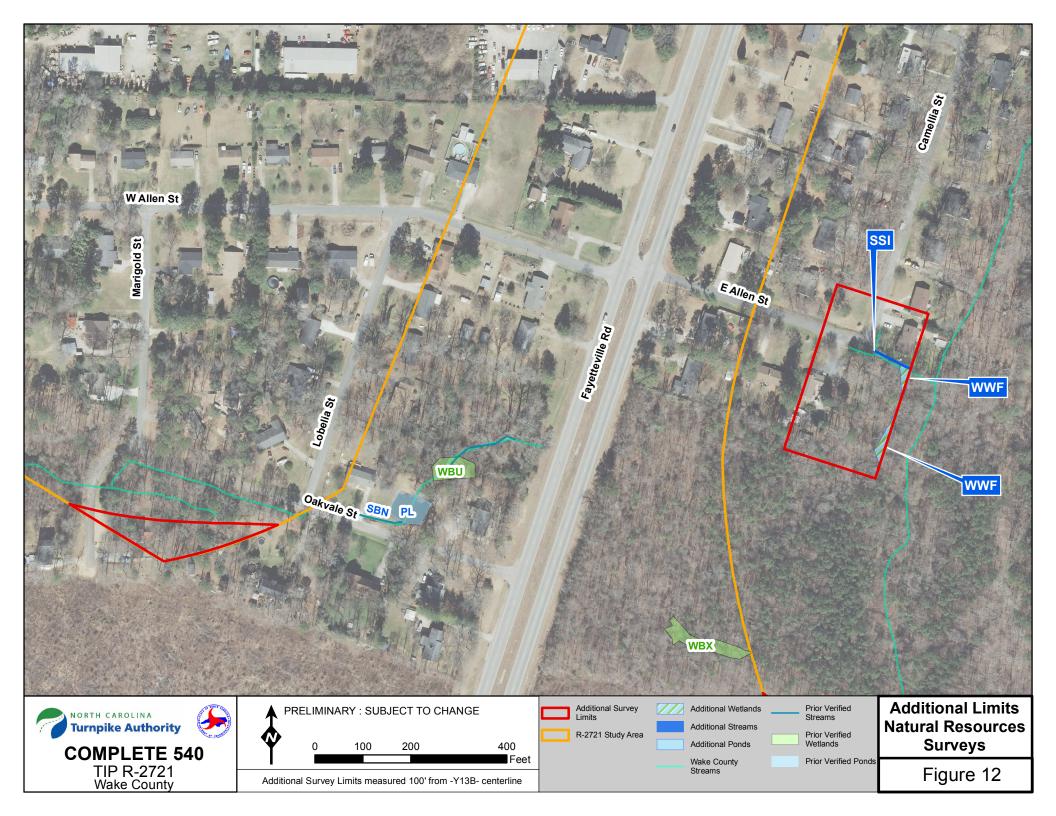


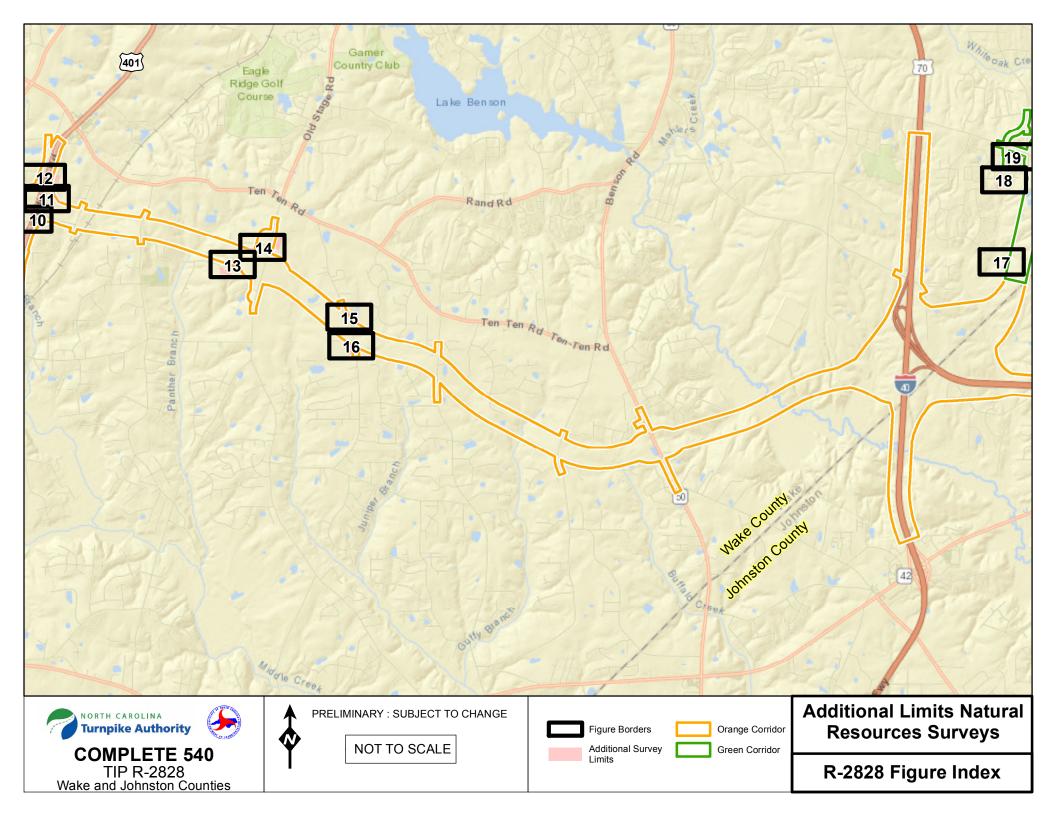


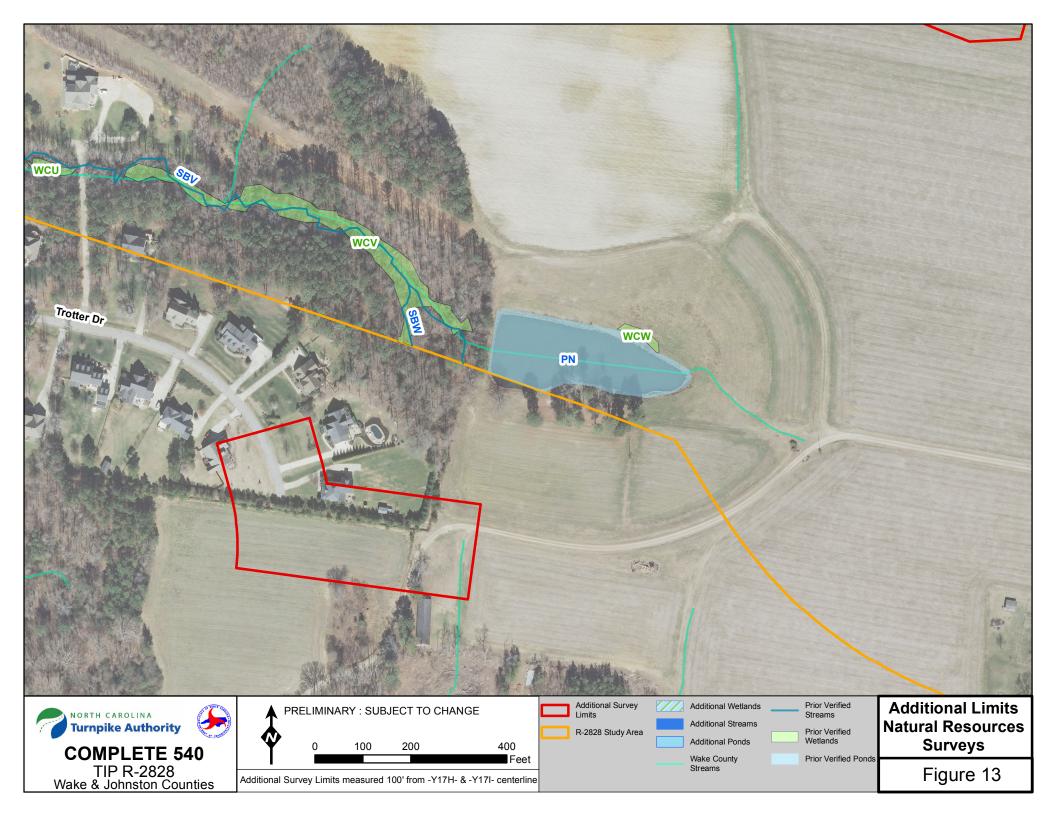


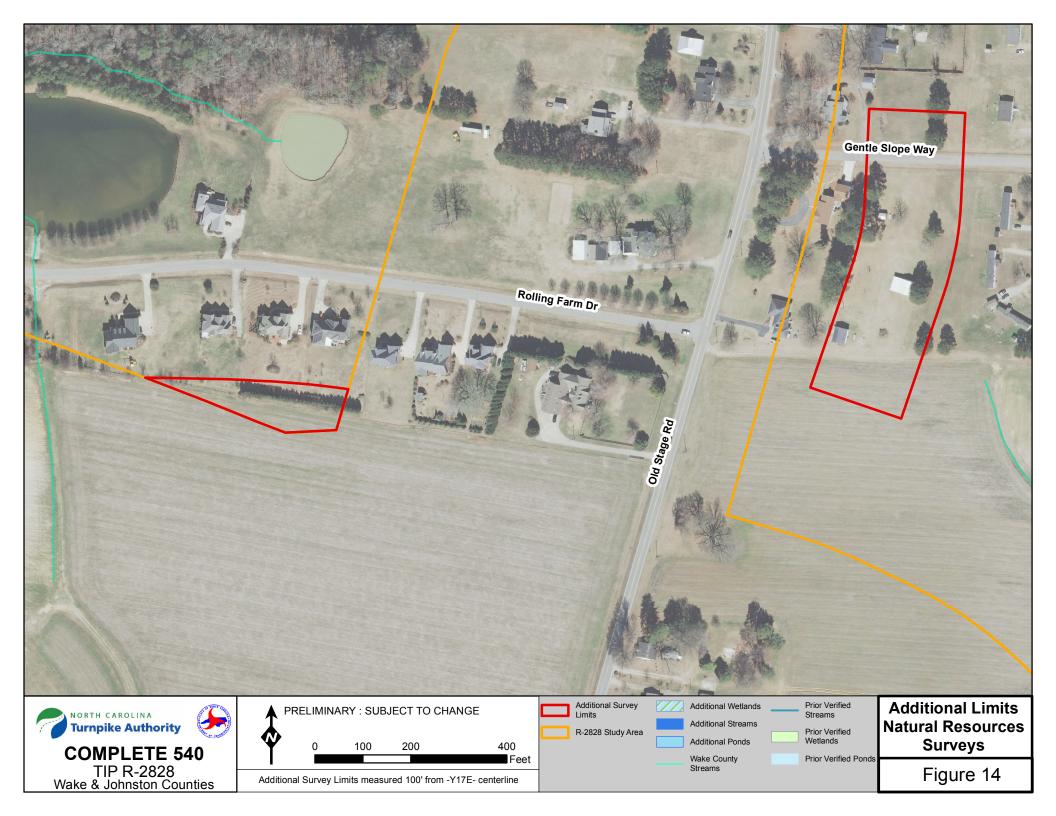


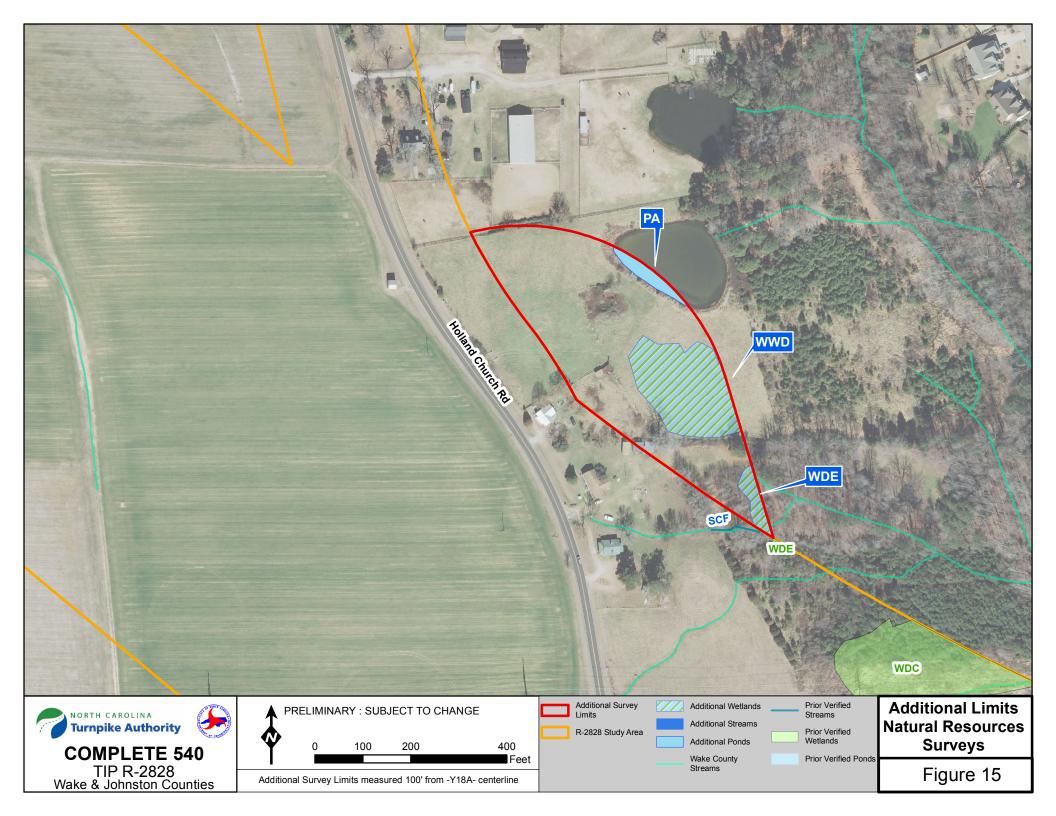


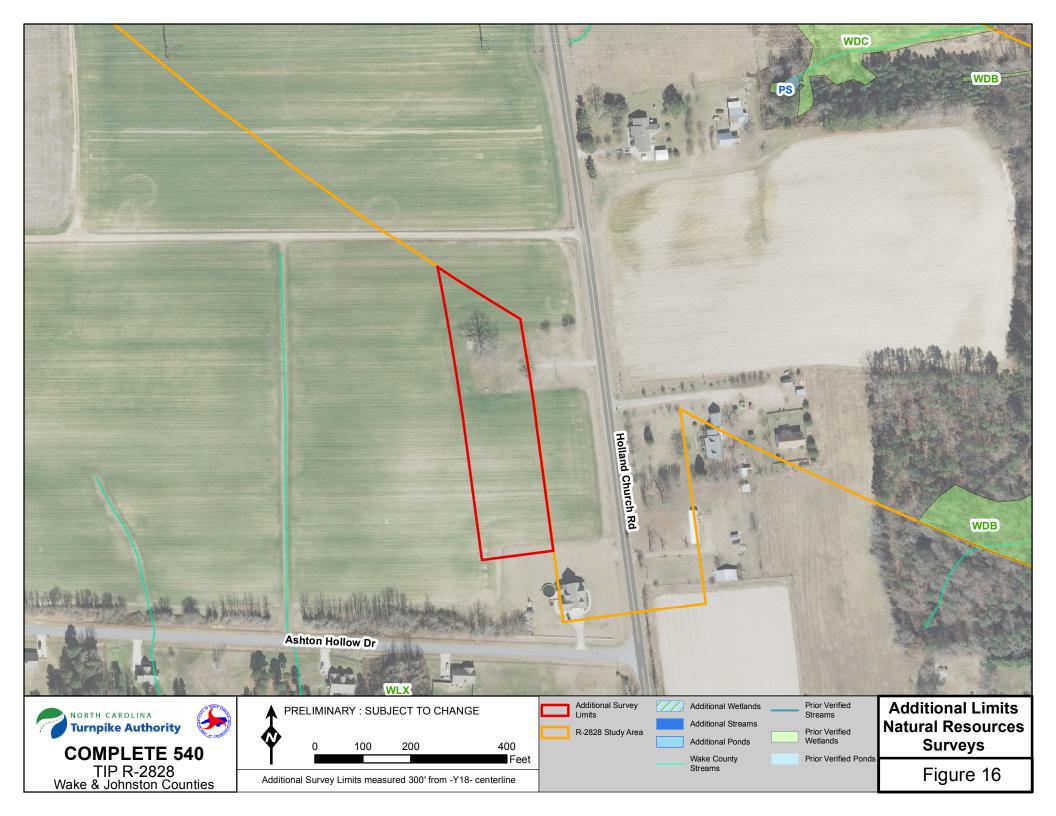


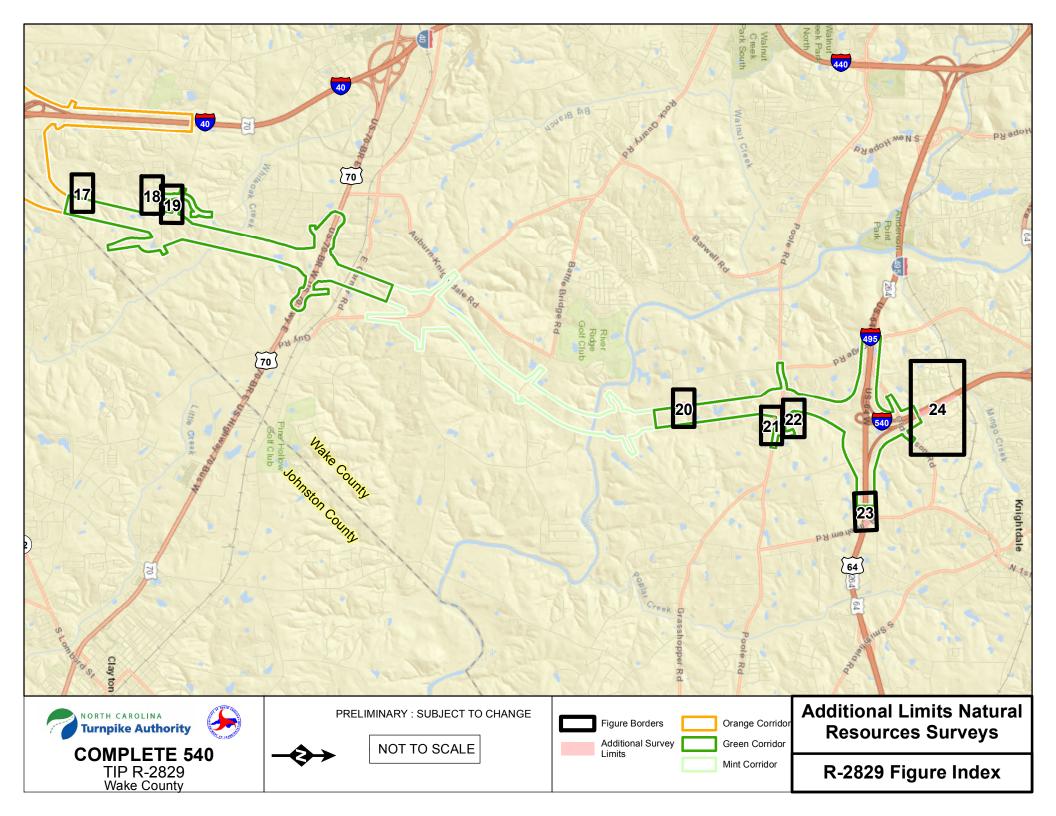


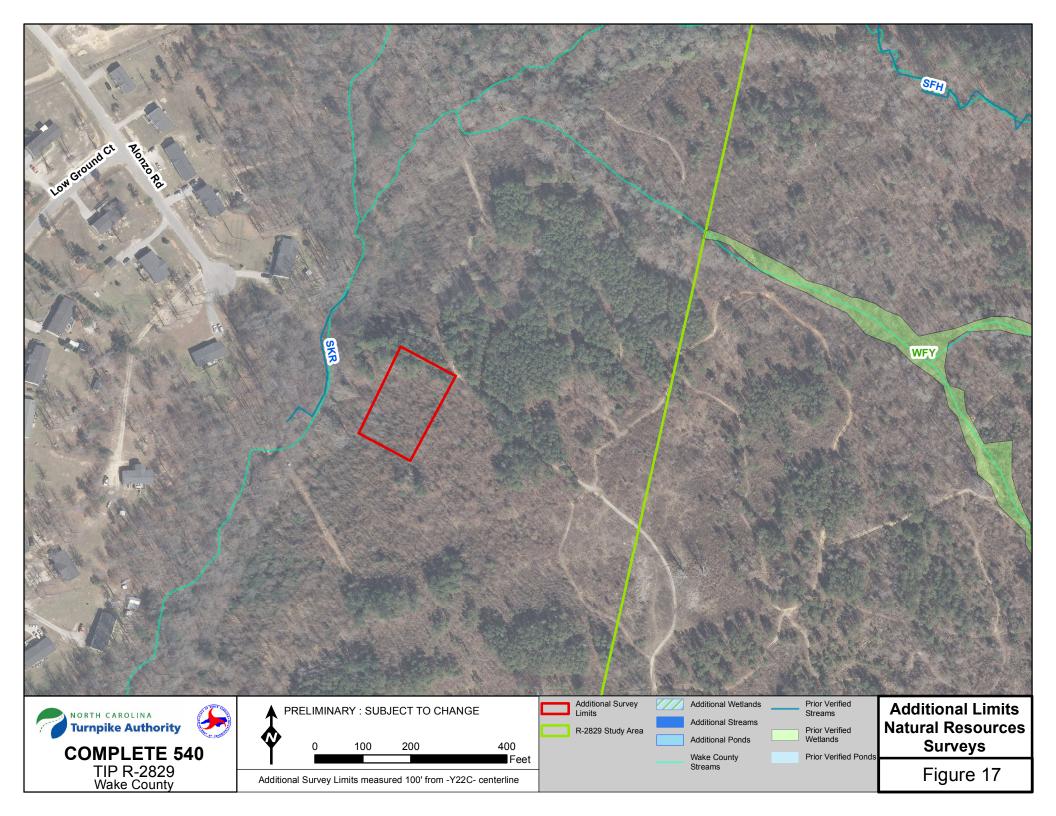


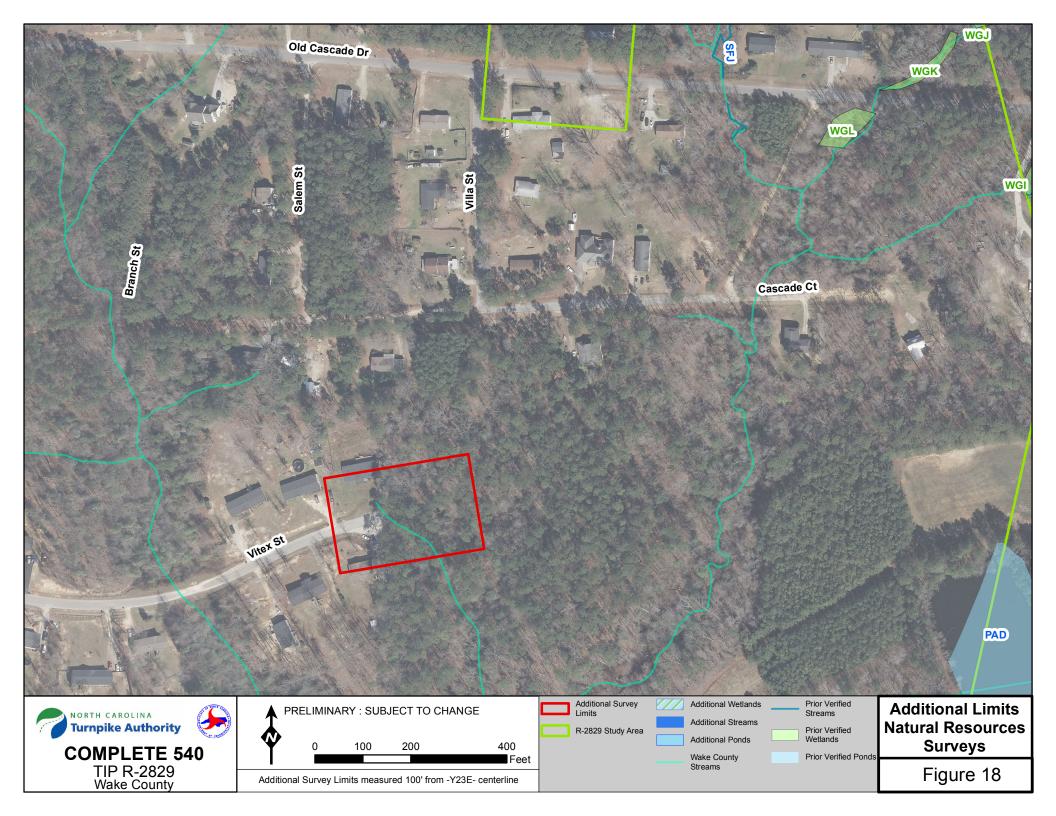


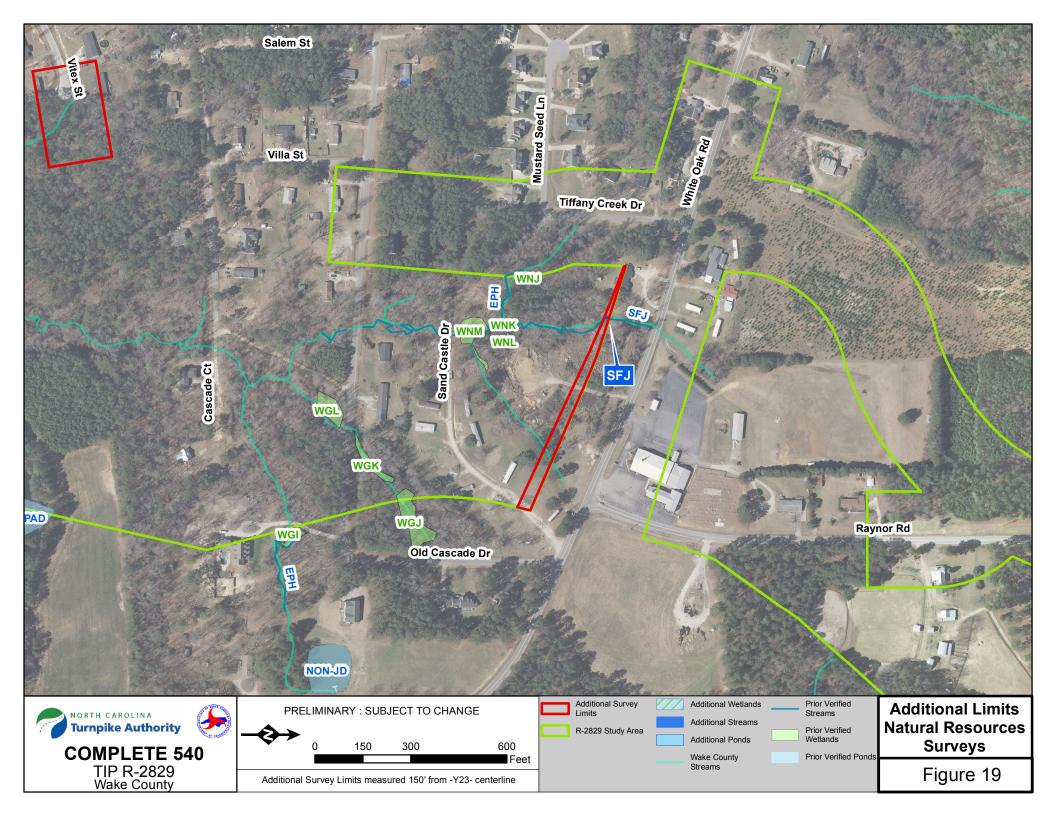


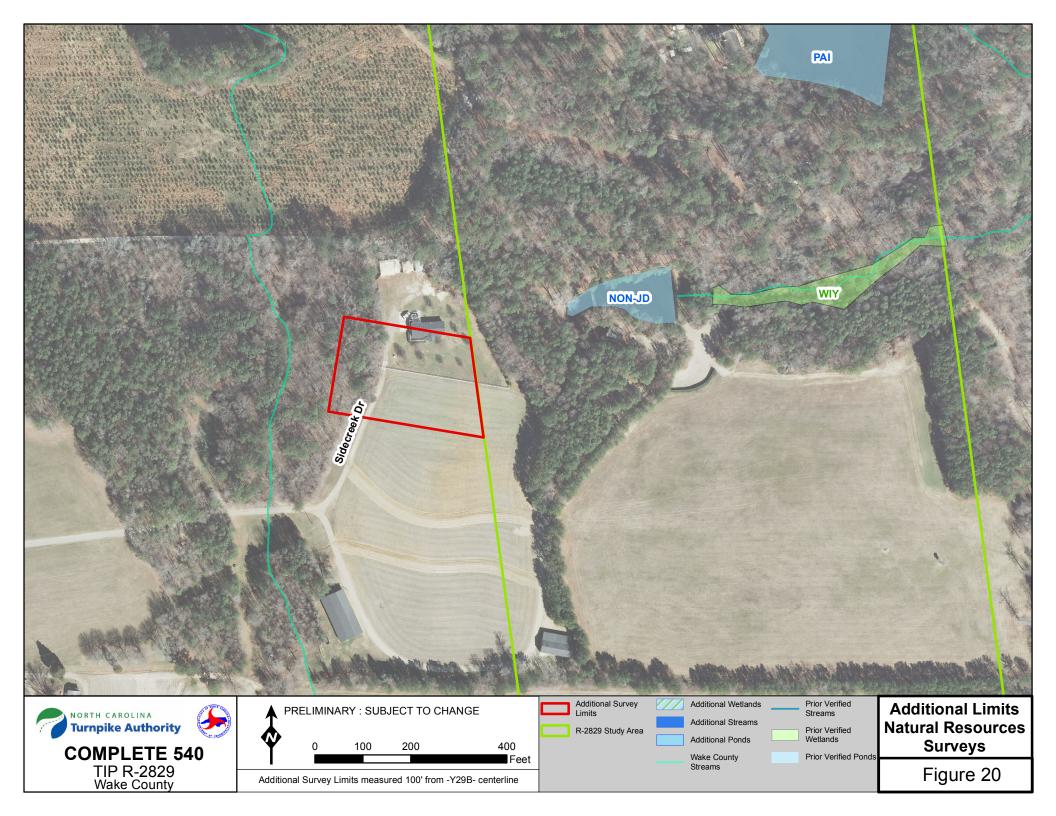


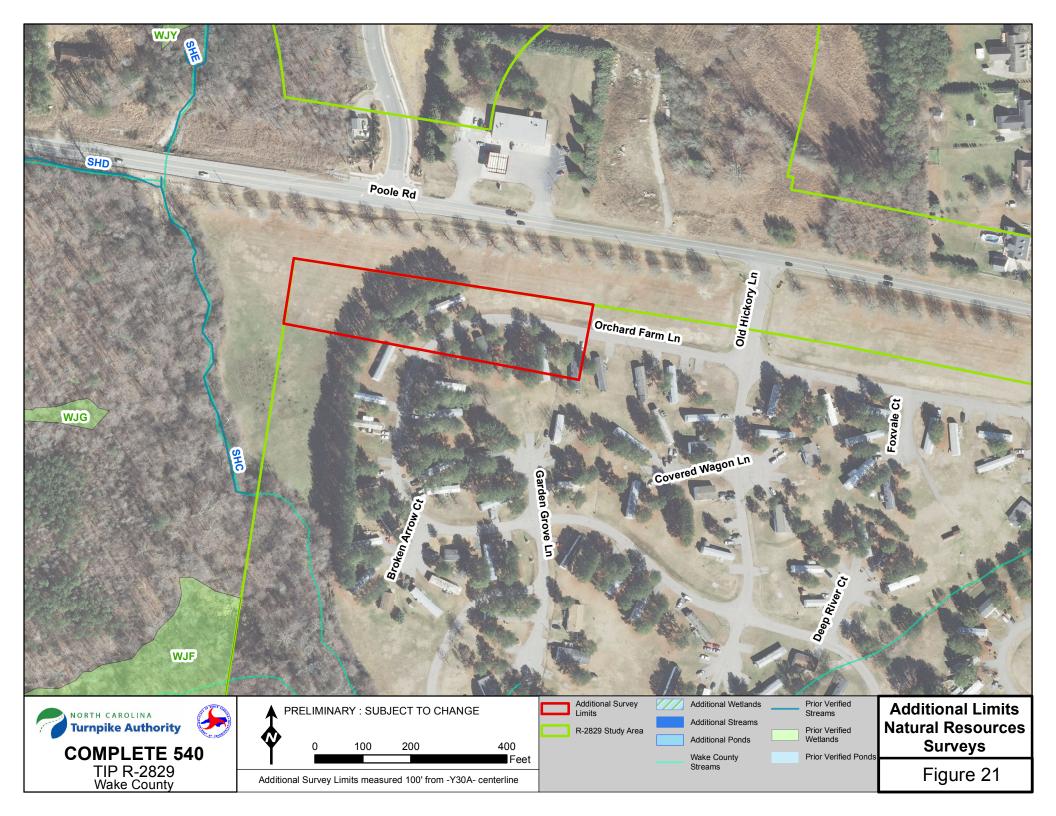


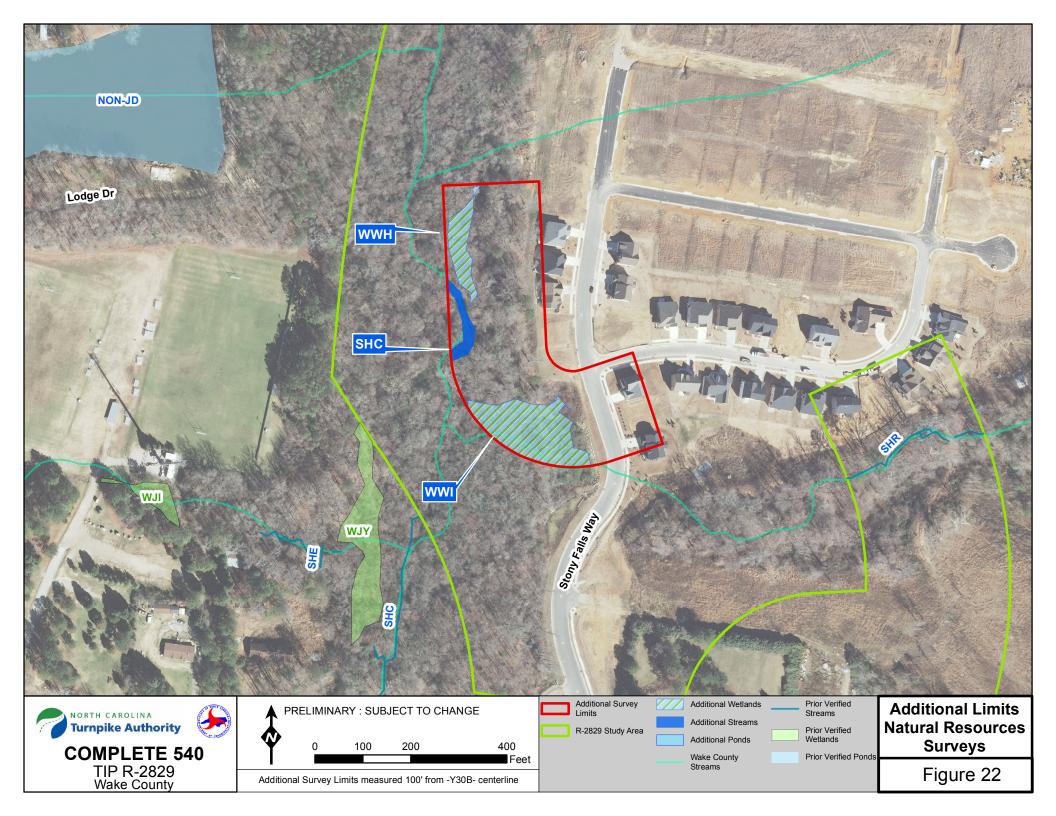


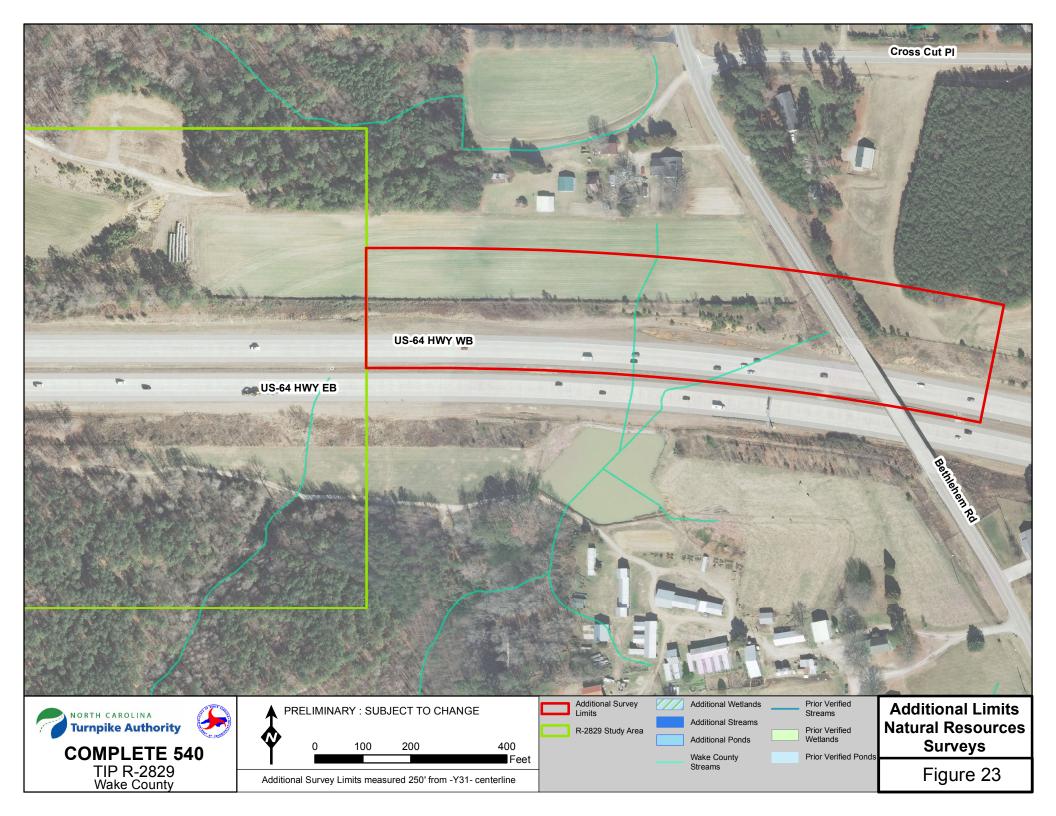


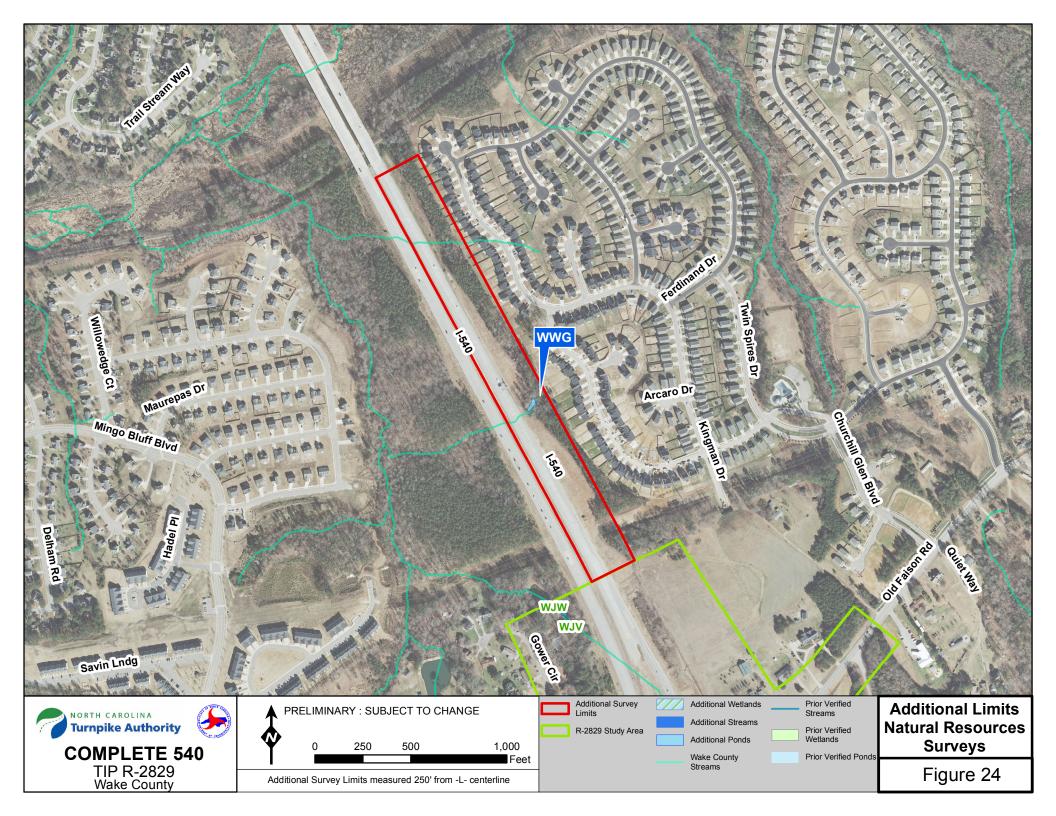












- Big Branch

NC DWO Stream Identification Form Version 4.11

Date: 8/14/17	Project/Site: C540	Latitude: 35, 68286
Evaluator: J. Tisdale / J. Garvey	County: WAKE	Longitude: -7-8,8518
Total Points:  Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name: APEX

if ≥ 19 or perennial if ≥ 30*	Cpitemeral in	emittent Perenn	e.g. Quad Name	TIEX
A Goomorphology (Subtotal - 19	Absent	Weak	Moderate	Strong
A. Geomorphology (Subtotal = 19 )  1ª Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	2	
In-channel structure: ex. riffle-pool, step-pool,		ļ		3
ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	(3)
6. Depositional bars or benches	0	1	2	<u></u>
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	N	o = 0	Yes =	3
artificial ditches are not rated; see discussions in manual				
3. Hydrology (Subtotal = 65)				**
2. Presence of Baseflow	0	1	<b>②</b>	3
3. Iron oxidizing bacteria	0	1	2	3
4. Leaf litter	1.5	97	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5	1	1.5
7. Soil-based evidence of high water table?	No	0 = 0	Yes =	3
C. Biology (Subtotal =9)				
8. Fibrous roots in streambed	3	2	1	0
9. Rooted upland plants in streambed	3	2	1	0
O. Macrobenthos (note diversity and abundance)	0	1	2	3
1. Aquatic Mollusks	0	1	2	3
2. Fish	0	0.5	0	1.5
3. Crayfish	0	0.5	1	1.5
4. Amphibians	0	0.5	0	1.5
5. Algae	0	0.5	1	1.5
5. Wetland plants in streambed		FACW = 0.75; O	BL = 1.5 Other = 0	
perennial streams may also be identified using other method	s. See p. 35 of manual			
lotes:	70%	*		
ketch: Bank height: 1-2' Bankfull width: 2-8' Water depth: 2"-18" Substrate: Sand, gravel,	a. l-L	197		
Substrate: Sand, grave!	I   T ■	2	8	
Velocity: fast, modern Clarity: clean, turbid	EE, 31100	.v.loid		
Clairy Clear, Furble	1. Dudland 1	UPPICE		

SO-Middle Creek NC DWQ Stream Identification Form Version 4.11 Project/Site: Date: County: Evaluator: **Total Points:** Stream Determination (circle one) Stream is at least intermittent Ephemeral Intermittent Perennial eg Quad Name: APEX if ≥ 19 or perennial if ≥ 30\* Absent Weak Moderate Strong A. Geomorphology (Subtotal = 1ª Continuity of channel bed and bank 0 2 (3) 1 0 (2) 2. Sinuosity of channel along thalweg 1 3 3. In-channel structure: ex. riffle-pool, step-pool, 0 1 (2) 3 ripple-pool sequence 4. Particle size of stream substrate 0 3 1 (2) 5. Active/relict floodplain 0 (1) 2 3 0 3 6. Depositional bars or benches 2 1 7. Recent alluvial deposits 0 1 2 3 2 8. Headcuts (0) 1 3 0 0.5 1 1.5 9. Grade control 0 0.5 1 1.5 10. Natural valley 11. Second or greater order channel No = 0Yes =(3) artificial ditches are not rated; see discussions in manual 9.01 B. Hydrology (Subtotal = 0 1 2 (3) 12. Presence of Baseflow 13. Iron oxidizing bacteria 0 1 2 3 (1.5) 0.5 14. Leaf litter 1 0 (0.5) 15. Sediment on plants or debris 0 1 1.5 1 16. Organic debris lines or piles 0 0.5 1.5 No = 017. Soil-based evidence of high water table? Yes = 3 C. Biology (Subtotal = (3) 2 0 18. Fibrous roots in streambed (3)19. Rooted upland plants in streambed 2 1 0 20. Macrobenthos (note diversity and abundance) 0 1 2 3 0) 2 3 21. Aquatic Mollusks 1 O 0.5 1 1.5 22. Fish 23. Crayfish 0 (0.5) 1 1.5 24. Amphibians 0 0.5 1 1.5 0 0.5 1.5 25. Algae FACW = 0.75: OBL = 1.5 Other = 0 26. Wetland plants in streambed \*perennial streams may also be identified using other methods. See p. 35 of manual. Notes: Sketch:

in with: 15-20 r depth: 4"- 18" trate: sund, bilt, gravel

ty: fast, moderate, slow y: clear, turbid, slightly turbid

NC DWQ Stream Identification Fo	rm version 4.11	
Date: 8/14/17	Project/Site: C540	Latitude: 35. 68996
Evaluator: J. Tisdaly	County: WAVEE	Longitude: -78,8415
Total Points:  Stream is at least intermittent  if > 10 or perennial if > 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name: APEX

Absent 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Weak  1  1  1  1  1  1  1  1  1  1  1  1  1	Moderate  2  2  2  2  2	Strong 3 3 3
0 0 0 0 0 0	1 1 1 1 (1)	2 2 2	3 3 3 3
0 0 0 0 0	1 1 1 (1)	2 2 2	3 3
0 0 0	1 1 (1)	2 2 2	3
0 0 0	1 (1)	2 2	3
0 0	(1)	2	
0			2
	(T)		3
0		2	3
	1	2	3
0	1	2	3
0	0.5		1.5
0	0.5		1,5
No	= 0	Yes =	3
0	1	2	3
(0)	1	2	3
1.5	(T)	0.5	0
0	(0.5)	1	1.5
(0)	0.5	1	1.5
No	= 0	Yes =	3)
-1		W.	
3	(2)	1	0
(3)	2	1	0
0	1	2	3
(0)	1	2	3
(0)	0.5	1	1.5
(0)	0.5	1	1.5
0	(0.5)	1	1.5
(0)	0.5	1	1.5
	FACW = 0.75; OI	BL = 1.5 Other = 0	
	0 0 0 No	0 1 0 0.5 0 0.5 0 0.5 No = 0	0 1 2 1 0 0 0.5 1 0 0 0.5 1 0 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0 0 0 0.5 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

ter depth: 2'-2'
ter depth: 1"-1'
bostrate: Sand, silt, gravel, collede, bedrock.
locity: fast, moderate, slow
arity: clean turbid. slightly turbid

- point lake
downstre on of

from old SA to head wit SAB NC DWQ Stream Identification Form Version 4.11 Latitude: 35. 67838 Project/Site: 0540 Date: Evaluator: S. Easterly Longitude: -78.7928 County: T, (arten **Total Points:** Stream Determination (circle one) Stream is at least intermittent e.g. Quad Name: APe X Ephemeral Intermittent Perennial if ≥ 19 or perennial if ≥ 30\* Moderate Absent Weak Strong A. Geomorphology (Subtotal = 1<sup>a.</sup> Continuity of channel bed and bank 0 1 (3) 2. Sinuosity of channel along thalweg 0 1 3 3. In-channel structure; ex. riffle-pool, step-pool, 0 1 (2) 3 ripple-pool sequence 4. Particle size of stream substrate 0 1 3 2 5. Active/relict floodplain (0) 2 3 1 (1) 2 6. Depositional bars or benches 0 3 (0) 2 7. Recent alluvial deposits 3 0 1 2 8. Headcuts 3 9. Grade control (0) 1 1.5 0.5 (0) 10. Natural valley 0.5 1 1.5 11. Second or greater order channel No =(0) Yes = 3artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 12. Presence of Baseflow 0 1 2 3 (0) 13. Iron oxidizing bacteria 1 2 3 1.5 14. Leaf litter (1) 0.5 0 15. Sediment on plants or debris 0 0.5 1 1.5 0 16. Organic debris lines or piles 0 0.5 1.5 17. Soil-based evidence of high water table? No = 0 Yes = 3 C. Biology (Subtotal = 18. Fibrous roots in streambed 1 0 3 19. Rooted upland plants in streambed 2 1 0 0 2 20. Macrobenthos (note diversity and abundance) 1 3 0) 2 21. Aquatic Mollusks 1 3 0 0.5 22. Fish 1 1.5 23. Crayfish (0) 0.5 1 1.5 0 24. Amphibians 0.5 1 1.5 0 0.5 1.5 25. Algae NA FACW = 0.75; OBL = 1.5 Other = 0 26. Wetland plants in streambed "perennial streams may also be identified using other methods. See p. 35 of manual. Notes: Wight. 2-3 From old Study avea to depth: 0 - no water Point 2" head wit" Sketch: ostrate: convel, Lobbie, Sand locity: fast, moderate, sliw NA - No water arity: clear, turbid. slightly turbid NA - No water

Sweed high ephemeral due to Lach of wuter. World Sine at least intermittent if had water in it NC DWQ Stream Identification Form Version 4.11

Date: 8/15/14	Project/Site: C 540	Latitude: 35.67375
Evaluator: S. Kasterly, T. Carler	,	Longitude: _ 78, 7493
Total Points:  Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*  23.5	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other Lake e.g. Quad Name: Wheeler

A. Geomorphology (Subtotal = 12)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3)
2. Sinuosity of channel along thalweg	0	1	2	3)
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	0.5	1	1.5
IO. Natural valley	0	0.5	(1)	1.5
1. Second or greater order channel	No	=(0)	Yes =	
artificial ditches are not rated; see discussions in manual				
3. Hydrology (Subtotal = 5,5)			Per	*
2. Presence of Baseflow	<b>©</b>	1	2	3
3. Iron oxidizing bacteria	(D)	1	2	3
4. Leaf litter	1.5	(1)	0.5	0
5. Sediment on plants or debris	0	0.5>	1	1.5
6. Organic debris lines or piles	0	0.5	(1)	1.5
7. Soil-based evidence of high water table?	No =	0	Yes =	
C. Biology (Subtotal =()				
8. Fibrous roots in streambed	(3)	2	1	0
9. Rooted upland plants in streambed	(3)	2	1	0
Macrobenthos (note diversity and abundance)	0	1	2	3
1. Aquatic Mollusks	(0)	1	2	3
2. Fish	0	0.5	1	1.5
3. Crayfish	0	0.5	1	1.5
1. Amphibians	(0)	0.5	1	1.5
5. Algae	(0)	0.5	1	1.5
5. Wetland plants in streambed		ACW = 0.75; OF	3L = 1.5 Other = 0	3
perennial streams may also be identified using other methods				
otes:				
Ketch: Bank height: 2-4 Bankfull wighth: 8		water:	. cleannei	1.0
water death:	8	G 1 1 M G	20 1 W. 1 - ME. 2	KINE III
water opposite	1 coppletes			
water depth: gand, grave	- LUNDE	. Λ	3	
Velocity fast, moderal clarity clear, turbed		1 1/7	1	
15,001.7	1. 1.11	L. I NA	- MAINATER	

See premises from

NC DWQ Stream Identification Form Version 4.11

The Day Otteam Identification Form				
Date: 81517	Project/Site:	C540	Latitude: 35,	65533
Evaluator: S. Easterly Tlarter	County:	Vake	Longitude: _	78.7019
Total Points:  Stream is at least intermittent		ination (circle one) ermittent (Perennial)	Other (d) e.g. Quad Name	78.7019 Le Wheeler
11 /		· ~		•
A. Geomorphology (Subtotal = 16,5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	0
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	<b>(3)</b>	3
ripple-pool sequence	U	<u> </u>	3	3
4. Particle size of stream substrate	0	1	3	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	<u>(0)</u>	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	No	= 0	Yes 7	~
artificial ditches are not rated; see discussions in manual			100 (	3
B. Hydrology (Subtotal = 85)	4			3
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	@	1	2	3
14. Leaf litter	1.5		0.5	
				0
15. Sediment on plants or debris	(0)	0.5	0	1.5
16. Organic debris lines or piles     17. Soil-based evidence of high water table?	0	0.5 = 0	1 /	1.5
	INO	-0	Yes =	3)
C. Biology (Subtotal = 4)	0			
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	<b>Ø</b>	2	1	0
20. Macrobenthos (note diversity and abundance)	0	<b>①</b>	2	3
21. Aquatic Mollusks	۵	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0)	0.5	1	1.5
24. Amphibians	0	Q.5°	11	1.5
25. Algae	(9)	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OBL =	1.5 Other = 0	
*perennial streams may also be identified using other methods. S	ee p. 35 of manual.			
Notes:				
Sketch: Bank height: 1-3 Bankfull wighth: 1-3 Water depth: 1-3 Substrate: 5and, 47000000000000000000000000000000000000	Sliw	vdoid		

NC DWO Stream Identification Form Version 4.11

SFJ

NC DWQ Stream Identification Form	version 4.11	310		
Date: 8/16/17	Project/Site: (	C 540	Latitude: 35	5.661427
Evaluator: V. Miller, J. Garvey	County: ${\cal U}$	lake	Longitude: - 78.5488	
Total Points:  Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent) Perennial	Other Ga e.g. Quad Name	rner:
		4		<b>*</b>
A. Geomorphology (Subtotal = 13 )	Absent	Weak	Moderate	Strong
1ª Continuity of channel bed and bank	0	1	2	(3)
Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	Q	2	3
ripple-pool sequence	0	<u>U</u>		
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0 "	1	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes =	= 3
artificial ditches are not rated; see discussions in manual				4
B. Hydrology (Subtotal = 6.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes #	3)
C. Biology (Subtotal =				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	6	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	6	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	6	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OBL	= 1.5 Other = 0	
*perennial streams may also be identified using other methods. S	See p. 35 of manual.			
Notes:				
Sketch: Bank height: 8-10  Bankfull wight: 5-7  Water depth: 0-2  Substrate: Sand, gr  Velocity: fast, moderate  Clarity: clary-typhid	avel 2 Sliw slightly to	urloid		2

NC DWQ Stream Identification Form Version 4.11 54C

THE BIT Q SELECTION TO COMMENT OF THE SELECTION TO COMMENT	III V OI STOTE TITLE	
Date: 8 16 17	Project/Site: C 540	Latitude: 35.75666
Evaluator: VM, JG	County: Wake	Longitude: -78,5079
Total Points:  Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*  40, 5	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other Raleigh e.g. Quad Name: East

A. Geomorphology (Subtotal = 2)	Absent	Weak	Moderate	Strong	
1 <sup>a</sup> Continuity of channel bed and bank	0	1	2	(3)	
2. Sinuosity of channel along thalweg	0	1	2	(3)	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	(1)	2	3	
5. Active/relict floodplain	0	1	(2)	3	
6. Depositional bars or benches	0	1	2	(3)	
7. Recent alluvial deposits	0	1	(2)	3	
8. Headcuts	(0)	1	2	3	
9. Grade control	0	(0.5)	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	No	= 0	Yes/=	3	

12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0 Yes ≠ 3			
C. Biology (Subtotal = 9,5)				
18. Fibrous roots in streambed	3	2	11	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks Corpicy (a.	0		2	3
22. Fish	0	(0.5)	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75: OF	3L = 1.5 Other = 0	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

Bank height: 6+++
Bankfull wighth: 8-10-ft
water depth: 2-6"

Substrate: sand, small grave Velocity: fast moderate, sliw

ty": clean torbid, slightly torbid

NC DWO Stream Identification Form Version 4.11

NC DWQ Stream Identification Form	version 4.11				
Date: 8/14/17	Project/Site:		Latitude: 35	5.68776	
Evaluator: JT, SE, JG	County:	vake	Longitude: -78,8489		
Total Points:  Stream is at least intermittent		ination (circle one) ermittent Perennial	Other		
		74			
A. Geomorphology (Subtotal = 15.5)	Absent	Weak	Moderate	Strong	
1 <sup>a</sup> Continuity of channel bed and bank	0	1	2	(3)	
2. Sinuosity of channel along thalweg	0	1	2	(3)	
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3	
ripple-pool sequence	0			3	
Particle size of stream substrate	0	(1)	2	3	
5. Active/relict floodplain	0	0	2	3	
Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1'	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1)	1.5	
11. Second or greater order channel	No	0 = 0	Yes	3)	
artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal =					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	(0)	1	2	3	
14. Leaf litter	1.5	(1)	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	<b>(1)</b>	1.5	
17. Soil-based evidence of high water table?		= 0	Yes		
C. Biology (Subtotal =	1				
18. Fibrous roots in streambed	3	(2)	1	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	0	0.5	1	1.5	
	0	0.5		1.5	
23. Crayfish	0	(0.5)	1.	1.5	
24. Amphibians			1		
25. Algae 26. Wetland plants in streambed ルム	.0)	0.5   FACW = 0.75; OBL		1.5	
	Soo p 35 of manual		- 1.5 Other - 0		
*perennial streams may also be identified using other methods.	See p. 35 of manual.	- 1	7.		
Notes: Beat-6	alem to	alterns a	D ST7011		
0.41.41.24	10	, ,	y vicean		
Sketch: Bank height: 2-4		Saw Z			
Bankfull Width. 12		bhas:	0.44	,	
water death: 2" - 18"		Gream is influence	relennia	· ,	
		in Fluence	1 by Beaver	Actiont	
Substrate: 5, 17, Sand	· stand		· ·	5.1.0	
Velocity: fast, moderat	L,SIIW			:0	
clarity: clear, turbid.	Slightly to	urbid			

NC DWQ Stream Identification Form	Version 4.11	>>IT		
Date: 8/14/17	Project/Site:	6540	Latitude: 3 4	5.68022
Evaluator: S. Easterly, T. Carden	County: Wake		Longitude: _ 78, 824	
Total Points:  Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*  22,5	Stream Determination (circle one)		Other e.g. Quad Name: Ape X	
- IA -		Čia		
A. Geomorphology (Subtotal = 10,5)	Absent	Weak	Moderate	Strong
1 <sup>a</sup> Continuity of channel bed and bank	0	1	<u>Q</u>	3
Sinuosity of channel along thalweg	0	0	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	0	2	3
ripple-pool sequence 4. Particle size of stream substrate	ď	0	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	12	2	
7. Recent alluvial deposits	0		2	3
		1		3
8. Headcuts	0		2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0 1	0.52	1	1.5
11. Second or greater order channel	No No	(0)	Yes = 3	
artificial ditches are not rated; see discussions in manual				5
B. Hydrology (Subtotal =)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	(9)	1	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
6. Organic debris lines or piles	0	0.5	1	1.5
7. Soil-based evidence of high water table?	No:	=0	Yes =	3
C. Biology (Subtotal = + )				
18. Fibrous roots in streambed	(3)	2	1	0
9. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
1. Aquatic Mollusks	(0)	1	2	3
2. Fish	0	(0.5)	1	1.5
3. Crayfish	0	0.5	1	1.5
4. Amphibians	0	0.5	1	1.5
5. Algae	60	0.5	1	1.5
6. Wetland plants in streambed		FACW = 0.75; OBL =	= 1.5 Other = 0	
perennial streams may also be identified using other methods.				-
lotes:				
ketch: Bank height: 4 Bankfull width Water depth: Substrate: Velocity fast, moderat	3" 2, 5, H, Sand	A P		)
clarity clear turbid	slightly to	rloid	3	

NC DWQ Stream Identification Form Version 4.11

Project/Site: 2540	Latitude: 35. 658 53
	Longitude: _78.7021
Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name: WHENER
	County: Wake Stream Determination (circle one)

55 I

I E 19 Or percinilar ii 200			1	WILL
0.00		***************************************	N.	
A. Geomorphology (Subtotal = 11.5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(F)	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	(0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0 (0.5) 1		1.5
11. Second or greater order channel	No	= 0	Yes =	3
a artificial ditches are not rated; see discussions in manual				21
B. Hydrology (Subtotal =				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No =	= 0	Yes =	3 )
C. Biology (Subtotal = 7, 5)				
8. Fibrous roots in streambed	3)	2	1	0
Rooted upland plants in streambed	3	2	1	0
	- See			

18. Fibrous roots in streambed	3)	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	12	2	3
21. Aquatic Mollusks	Ø)	1	2	3
22. Fish	.0	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	Ö	0.5	1	1.5
25. Algae	(0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

Bankfull wieth: 4'
water depth: 2" - 12"
Substrate: sand, gravel, 51t
Velocity: fast, moderate, slow
Clarity: clear, turbid, slightly turbid

SSI Starts ad a pirc and unflownes with anning strangowisd of the study area by appar 20-

# WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

WR

Project/Site:Triangle Expressway (A1)	City/County: Wake Sampling Date: 2/23/2010
Applicant/Owner: N.C. Turnpike Authority	State: NC Sampling Point: A1WK006
Investigator(s): Mark Mickley, Mulkey, Inc.	Section, Township, Range: Feltonville
Landform (hillslope, terrace, etc.): Floodplain	Local relief (concave, convex, none): Concave
Slope (%): 4 Lat: 35.680433	Long: -78.823754 Datum: NAD83
Soil Map Unit Name: Herndon silt loam	NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of ye	
Are Vegetation, Soil, or Hydrology significantly	
Are Vegetation , Soil , or Hydrology naturally pro	
SUMMARY OF FINDINGS – Attach site map showing	sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present?  Hydric Soil Present?  Wetland Hydrology Present?  Remarks:  Yes X No Yes X No Present?  Yes X No Present?  Yes X No Present?	Is the Sampled Area within a Wetland? Yes X No
NCWAM - Bottomland Hardwood	
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1)	(57)
High Water Table (A2)  Hydrogen Sulfi	
	spheres on Living Roots (C3) Moss Trim Lines (B16)
	educed Iron (C4) Dry-Season Water Table (C2)
	duction in Tilled Soils (C6) Crayfish Burrows (C8)
☐ Drift Deposits (B3) ☐ Thin Muck Surf ☐ Algal Mat or Crust (B4) ☐ Other (Explain	
Iron Deposits (B5)	in Remarks)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	X FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes X No Depth (inches)	
Water Table Present? Yes X No Depth (inches)	
Saturation Present? Yes X No Depth (inches)	: Wetland Hydrology Present? Yes X No No No
(includes capillary fringe)  Describe Recorded Data (stream gauge, monitoring well, aerial photo	os, previous inspections), if available:
Remarks:	

Sampling Point:

	Absolute	Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30')		Species? Status	
1. Liriodendron tulipifera	40	X FAC	Number of Dominant Species That Are OBL, FACW, or FAC;  (A)
2. Acer rubrum	20	X FAC	That Are OBL, I ACW, OI I AC.
			Total Number of Dominant _
3. Quercus laurifolia		X FACW	Species Across All Strata: 7 (B)
4. Platanus occidentalis	10	FACW	
5,			Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)
6.			That Are OBL, FACW, or FAC: 100% (A/B)
			Prevalence Index worksheet:
7,			Total % Cover of: Multiply by:
151 s	90	= Total Cover	
Sapling Stratum (Plot size:15' )			OBL species x 1 =
1. Carpinus caroliniana	10	X FAC	FACW species x 2 =
2. Ilex opaca	10	X FAC	FAC species x 3 =
3			FACU species x 4 =
			UPL species x 5 =
4		==-	
5			Column Totals: (A) (B)
6			B 4 4 4 5 50
7			Prevalence Index = B/A =
	20	= Total Cover	Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size:)		. 5.0. 50701	Rapid Test for Hydrophytic Vegetation
1,,,,			Dominance Test is >50%
			Prevalence Index is ≤3.0 <sup>1</sup>
2,			
3.			Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
4			F=1
5			Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6			
			<sup>1</sup> Indicators of hydric soil and wetland hydrology must
7			be present, unless disturbed or problematic.
Herb Stratum (Plot size: 5' )		= Total Cover	Definitions of Vegetation Strata:
Herb Stratum (Plot size: 5' )	50	T FAC	
1. Microstegium vimineum			Tree – Woody plants, excluding woody vines,
2. Carex sp.	30		approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
3. Juncus effusus	2	FACW	(7.0 cm) of larger in diameter at bleast fleight (DBH).
4.			Sapling - Woody plants, excluding woody vines,
			approximately 20 ft (6 m) or more in height and less
5,		==-	than 3 in. (7.6 cm) DBH.
6,			Shrub – Woody plants, excluding woody vines.
7			approximately 3 to 20 ft (1 to 6 m) in height.
8,			approximation, a to go in ( ) to a mi, in reaging
9			Herb – All herbaceous (non-woody) plants, including
			herbaceous vines, regardless of size. Includes woody
10			plants, except woody vines, less than approximately 3 ft (1 m) in height.
11			it (1 m) in neight.
12			Woody vine - All woody vines, regardless of height.
PRODUCTO DE PRODUCTO LOS	82	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. Smilax rotundifolia	10	X FAC	
2. Toxicodendron radicans			
	2	FAC	
		FAC	
3.		FAC	Hydrophytic
3 4		FAC	Hydrophytic Vegetation
	2	FAC	
3 4	2	FAC	Vegetation
3			Vegetation
3 4			Vegetation
3			Vegetation

SOIL Sampling Point:

epth	Matrix			ox Features			_	
	Color (moist)	<u>%</u>	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0 - 3	10 YR 3/1	100	,				Loam	
3 - 12	10 YR 4/1	90	10 YR 4/6	10	RM_	M	SCL	ORC's
								-
			<del>7</del> =					<del>29-511</del>
							. 2.	
pe: C=Conce dric Soil Indic	ntration, D=Depl	etion, RM=	Reduced Matrix, C	S=Covered	or Coate	d Sand Gra	ins. 'Loc	cation: PL=Pore Lining, M=Matrix.  ators for Problematic Hydric Soils <sup>3</sup> :
Histosol (A1) Histic Epiped Black Histic ( Hydrogen Su Stratified Lay 2 cm Muck (A	on (A2) A3) Ifide (A4) ers (A5) A10) <b>(LRR N)</b> ow Dark Surface	e (A11)	Dark Surface Polyvalue Be Thin Dark Si Loamy Gley Depleted Ma Redox Dark Depleted Da Redox Depr	elow Surfac urface (S9) ed Matrix (I atrix (F3) Surface (F irk Surface	(MLRA 1=2) 6) (F7)		148)	cm Muck (A10) (MLRA 147) Piedmont Floodplain Soils (F19) (MLRA 136, 147) Red Parent Material (TF2) Very Shallow Dark Surface (TF12) Other (Explain in Remarks)
	Mineral (S1) (L	.RR N,	Iron-Mangar		s (F12) (I	LRR N,		
MLRA 147 Sandy Gleye Sandy Redox	d Matrix (S4) (S5)		Umbric Surfa	ace (F13) (			3) v	licators of hydrophytic vegetation and vetland hydrology must be present,
Stripped Mate	rix (S6) r (if observed):						u	nless disturbed or problematic.
Type:	(II Observed).							
Depth (inches)	):						Hydric Soil	Present? Yes X No
marks:								

## WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont,

WR

Project/Site:Triangle Expressway (A1)	City/County: Wake	Sampling Date: 2/23/2010
Applicant/Owner: N.C. Turnpike Authority	State:	NC Sampling Point: A1WK005-Up
Investigator(s): Mark Mickley, Mulkey, Inc.	Section, Township, Range: Feltonville	
Landform (hillslope, terrace, etc.): Hillslope	Local relief (concave, convex, r	none): Concave
Slope (%): 4% Lat: 35.680508	Long: -78.823534	Datum: NAD83
Soil Map Unit Name: Herndon silt loam	NWI cl	assification: Upland
Are climatic / hydrologic conditions on the site typical for this time of you		in in Remarks.)
		nces" present? Yes X No
Are Vegetation, Soil, or Hydrology naturally pr		
SUMMARY OF FINDINGS – Attach site map showing		,
Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?  Remarks:  Yes No X  Yes No X  No X	Is the Sampled Area within a Wetland? Yes	No X
HYDROLOGY		
Wetland Hydrology Indicators:	200	Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	· · · · · · · · · · · · · · · · · · ·	e Soil Cracks (B6)
Surface Water (A1)  High Water Table (A2)  True Aquatic F Hydrogen Sulfi		ely Vegetated Concave Surface (B8) ge Patterns (B10)
		Frim Lines (B16)
		eason Water Table (C2)
		sh Burrows (C8)
Drift Deposits (B3) Thin Muck Sur	face (C7)	tion Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)		d or Stressed Plants (D1)
Iron Deposits (B5)	p	orphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	-	w Aquitard (D3)
☐ Water-Stained Leaves (B9)☐ Aquatic Fauna (B13)		opographic Relief (D4) leutral Test (D5)
Field Observations:	L TAC-N	edital Test (D3)
Surface Water Present? Yes No X Depth (inches	<i>)</i> .	
Water Table Present?  Yes No X Depth (inches		
Saturation Present? Yes No X Depth (inches	·	Present? Yes No X
(includes capillary fringe)  Describe Recorded Data (stream gauge, monitoring well, aerial photo		
Describe Recorded Data (stream gauge, monitoring well, aerial priori	os, previous inspections), il available:	
Remarks:		
No indicators 49/ Clans		
No indicators, 4% Slope		

Sampling Point: \_\_A1WK005-Up

	Absolute	Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30')	% Cover	Species? Status	Number of Dominant Species
1. Quercus alba	30	X FACU	That Are OBL, FACW, or FAC:5 (A)
2. Carya ovata	20	X FACU	-
3. Liriodendron tulipifera	20	X FAC	Total Number of Dominant Species Across All Strata: 8 (B)
4 Pinus taeda	10	X FAC	Species Across All Strata: 8 (B)
**************************************			Percent of Dominant Species
5			That Are OBL, FACW, or FAC: 62% (A/B)
6			B
7.			Prevalence Index worksheet:
84	80	= Total Cover	Total % Cover of: Multiply by:
Sapling Stratum (Plot size:15' )			OBL species x 1 =
1. Quercus alba	20	X FACU	FACW species x 2 =
2. Liquidambar styraciflua	15	X FAC	FAC species x 3 =
3. Liriodendron tulipifera	15	X FAC	FACU species x 4 =
4. Ilex opaca	10	FAC	UPL species x 5 =
			Column Totals:(A)(B)
5			Column rotals(A)(B)
6	·		Prevalence Index = B/A =
7		<b>——</b> —	Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size:15' )	60	= Total Cover	Rapid Test for Hydrophytic Vegetation
			Dominance Test is >50%
1			
2			Prevalence Index is ≤3.0¹
3,	/		Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
4,			- Alexandria Company
5.			Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6,			
7			¹Indicators of hydric soil and wetland hydrology must
		= Total Cover	be present, unless disturbed or problematic.
Herb Stratum (Plot size: 5'	$\overline{}$	- Total Cover	Definitions of Vocatation Strate:
Herb Stratum (Plot size:)			Definitions of Vegetation Strata:
Herb Stratum (Plot size: 5' )  1. Polystichum acrostichoides	5	X FAC	
1. Polystichum acrostichoides		X FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in.
1. Polystichum acrostichoides 2		X FAC	Tree – Woody plants, excluding woody vines,
1. Polystichum acrostichoides 2		X FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
1. Polystichum acrostichoides 2		X FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less
1. Polystichum acrostichoides 2		X FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines,
1. Polystichum acrostichoides 2		X FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
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1. Polystichum acrostichoides 2	5	Total Cover	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.
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SOIL

Sampling Point: \_\_A1WK005-Up

(inchee)	Matrix	0/		Features	, 9			_
(inches)	Color (moist)		color (moist)	% Type <sup>1</sup>	_Loc <sup>2</sup> _	Texture		Remarks
0 - 3	10 YR 3/3	100				Loam	-	
3 - 12	2.5Y 6/4	100				SL		
	-							
		·						
			//				6	
							-	
Гуре: C=Cor	ncentration, D=Depl	letion, RM=Red	uced Matrix, CS=	Covered or Coate	d Sand Grain	s. <sup>2</sup> Lo	cation: PL=	Pore Lining, M=Matrix.
ydric Soil In	dicators:					Indic	ators for Pi	roblematic Hydric Soils
Histosol (/	A1)		Dark Surface (	S7)		2	cm Muck (/	A10) (MLRA 147)
🔲 Histic Epi	pedon (A2)			w Surface (S8) (N		8) 🔲 F	riedmont Flo	oodplain Soils (F19)
Black Hist			2.5	ace (S9) <b>(MLRA 1</b>	47, 148)	-	(MLRA 13	
	Sulfide (A4)	_	Loamy Gleyed					Material (TF2)
	Layers (A5)	<u> </u>	Depleted Matrix					/ Dark Surface (TF12)
	k (A10) (LRR N)	<u></u>	Redox Dark Su				Other (Expla	in in Remarks)
	Below Dark Surface	∍ (A11) ⊨	Depleted Dark					
	k Surface (A12)		Redox Depress					
	icky Mineral (S1) <b>(</b> L	.RR N,		e Masses (F12) (I	_RR N,			
	147, 148) eyed Matrix (S4)	Ē	MLRA 136)	e (F13) <b>(MLRA 13</b>	E 422\	3100	ligators of b	ydrophytic vegetation and
Sandy Re		<b>-</b>		iplain Soils (F19)				ology must be present,
	Matrix (S6)	L-	_ riedinont rioot	apiairi Solis (r. 19)	(111117 140)			bed or problematic.
	yer (if observed):						iliess distai	bed of problematic.
Туре:	.,							
Depth (inch						Hydric Soil	D	Yes No No
	ies)					Tyuric Soil	Present?	res No
lemarks:								



# WETLAND RATING WORKSHEET (4th VERSION)

Α	1WK	

Project Name: Southeastern Co Nearest Road: Dutch Elm Drive Wetland Area (ac): Name of Evaluator(s): Mark Mickles	3.02	Cour Date Wetl		Wake 2/23/2010 >100	
on sound or estusuary, pond or on perennial steam on intermittent stream within interstream divide other		(within 1/2  x fores  x agric  x impe	T LAND USE: mile upstream, u ted/natural vege ultural/ urbanize rvious surface becial Natural A	d <u>25</u> %	
SOILS:  Soil Series: Wehadke and Bile predominantly organic (humo predominantly mineral (non-series) predominantly sandy  HYDRAULIC FACTORS:	is, muck or peat)	1 <u>See U</u> 2 3 4		data form	
x freshwater brackish steep topography ditched or channelized x total wetland width >= 100 fe	eet	x seaso	nally flooded or nittently flooded	permenently flooded or inundated inundated inundated of temporary surface water ng or surface water	
x Bottomland Hardwood Fores Swamp Forest Carolina Bay Pocosin Pine Savannah Freshwater Marsh  * The rating system cannot be applied	Head Bog I Ephe Other	water Forest Forest meral Wetland			
DEM RATING					
WATER STORAGE	5	X 4	= _	20	
BANK, SHORELINE STABILIZATION	01	X 4	-	16	
POLLUTANT REMOVAL	4 *	X 5	-	20	
WILDLIFE HABITA	3	X 2	-	6	
AQUATIC LIFE HABITAT	3	X 4	-	12	
RECREATION/EDUCATION	2	X 1	=	2	
	TOTA	AL WETLAN	D SCORE =	76	

<sup>\*</sup> Add one point if in sensitive watershed and >10% nonpoint disturbance within 1/2 mile upstream, upslope, or radius.

### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

WS

Project/Site: _Triangle Expressway (A1X)	City/County: Wake Sampling Date: 3/8/2011
Applicant/Owner: N.C. Turnpike Authority	State: NC Sampling Point: AlXWA108
Investigator(s): Mark L. Mickley, Mulkey, Inc.	Section, Township, Range: Feltonville
Landform (hillslope, terrace, etc.): Floodplain	Local relief (concave, convex, none): None
Slope (%): 0% Lat: 35.678858	Long: -78.824126 Datum: NAD 83
Soil Map Unit Name: Wehadkee and Bibb soils	NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of ye	
	y disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally pr	· · · · · · · · · · · · · · · · · · ·
SUMMARY OF FINDINGS - Attach site map showing	g sampling point locations, transects, important features, etc
Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?  Remarks:  Yes X No Yes X No Present? Yes X No Present?	Is the Sampled Area within a Wetland? Yes X No
NCWAM - Bottomland Forest	
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
Surface Water (A1)  True Aquatic F	
High Water Table (A2)  Hydrogen Sulfi	process;
	ospheres on Living Roots (C3) Moss Trim Lines (B16)
	educed Iron (C4) Dry-Season Water Table (C2)
Sediment Deposits (B2)	eduction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3)	face (C7) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	in Remarks) Stunted or Stressed Plants (D1)
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No Depth (inches	
Water Table Present?  Yes X No Depth (inches	<i>"</i>
Saturation Present? Yes X No Depth (inches (includes capillary fringe)	s): Wetland Hydrology Present? Yes No
Describe Recorded Data (stream gauge, monitoring well, aerial photo	os, previous inspections), if available:
Remarks:	
	$\bar{n}$

	Absolute	Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:30 ft)	% Cover		
1. Liriodendron tulipifera	40	X FAC	Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)
2. Acer rubrum	20	X FAC	That Are OBL, FACW, or FAC: (A)
			Total Number of Dominant
3. Carpinus caroliniana	10	FAC_	Species Across All Strata:6 (B)
4. Platanus occidentalis	_ 5	FACW	
5			Percent of Dominant Species That Are OBL FACW or FAC: 100% (A/B)
			That Are OBL, FACW, or FAC:(A/B)
6			Prevalence Index worksheet:
7.			
150 New York 15	75	= Total Cover	Total % Cover of: Multiply by:
Sapling Stratum (Plot size:15 ft)			OBL species x 1 =
1. Ligustrum sinense	5	X FAC	FACW species x 2 =
2. Carpinus caroliniana	5	X FAC	FAC species x 3 =
3. Ilex opaca	5	X FAC	FACU species x 4 =
			T.
4			UPL species x 5 =
5			Column Totals: (A) (B)
6			
7			Prevalence Index = B/A =
1.5	15	- Total Cavas	Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size: 15 ft )		= Total Cover	Rapid Test for Hydrophytic Vegetation
			Dominance Test is >50%
1,		==	
2,			Prevalence Index is ≤3.0 <sup>1</sup>
3			Morphological Adaptations¹ (Provide supporting
4			data in Remarks or on a separate sheet)
5.			Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6	-		<sup>1</sup> Indicators of hydric soil and wetland hydrology must
7		<u> </u>	be present, unless disturbed or problematic.
l .			
E #		= Total Cover	Definitions of Vegetation Strata:
Herb Stratum (Plot size: 5 ft )	( <del></del>		Definitions of Vegetation Strata:
Herb Stratum (Plot size: 5 ft 1. Microstegium vimineum	75	= Total Cover	Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines,
1. Microstegium vimineum	75		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in.
1. Microstegium vimineum 2. Carex sp.	75 5		Tree – Woody plants, excluding woody vines,
1. Microstegium vimineum 2. Carex sp. 3.	75 5		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
1. Microstegium vimineum 2. Carex sp. 3	75 5		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines,
1. Microstegium vimineum 2. Carex sp. 3.	75 5		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
1. Microstegium vimineum 2. Carex sp. 3. 4.	75 5		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
1. Microstegium vimineum 2. Carex sp. 3	75 5		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines,
1. Microstegium vimineum 2. Carex sp. 3	75 5		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
1. Microstegium vimineum 2. Carex sp. 3	75 5		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including
1. Microstegium vimineum 2. Carex sp. 3. 4. 5. 6. 7. 8.	75 5		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody
1. Microstegium vimineum 2. Carex sp. 3. 4. 5. 6. 7. 8. 9	75 5		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3
1. Microstegium vimineum 2. Carex sp. 3. 4. 5. 6. 7. 8.	75 5		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody
1. Microstegium vimineum 2. Carex sp. 3. 4. 5. 6. 7. 8. 9	75 5		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
1. Microstegium vimineum 2. Carex sp. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 12.	75 5	X FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3
1. Microstegium vimineum 2. Carex sp. 3. 4. 5. 6. 7. 8. 9. 10.	75 5		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
1. Microstegium vimineum 2. Carex sp. 3. 4	75 5	X FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
1. Microstegium vimineum 2. Carex sp. 3. 4. 5. 6. 7. 8. 9. 11. 12.  Woody Vine Stratum (Plot size: 30 ft ) 1. Vitis rotundifolia	75 5 	FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
1. Microstegium vimineum 2. Carex sp. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. Woody Vine Stratum (Plot size: 30 ft ) 1. Vitis rotundifolia 2. Rubus sp.	75 5 	FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
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1. Microstegium vimineum 2. Carex sp. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12.  Woody Vine Stratum (Plot size: 30 ft ) 1. Vitis rotundifolia 2. Rubus sp. 3.	75 5 	FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
1. Microstegium vimineum 2. Carex sp. 3. 4. 5. 6. 7. 8. 9. 11. 12.  Woody Vine Stratum (Plot size: 30 ft ) 1. Vitis rotundifolia 2. Rubus sp. 3. 4.	75 5 	Total Cover	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
1. Microstegium vimineum 2. Carex sp. 3.	75 5 	FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
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1. Microstegium vimineum 2. Carex sp. 3.	75 5 	Total Cover	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
1. Microstegium vimineum 2. Carex sp. 3.	75 5 	Total Cover	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
1. Microstegium vimineum 2. Carex sp. 3.	75 5 	Total Cover	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
1. Microstegium vimineum 2. Carex sp. 3.	75 5 	Total Cover	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation

SOIL

Sampling Point: AIXWA109

Depth	Matrix			x Features					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	_Loc <sup>2</sup>	Texture	Remarks	
0 - 2	10 YR 4/2	100		<u> </u>			SCL		
2 - 6	10 YR 4/3	100					SCL		
6 - 12+	10 YR 5/2	90	10 YR 4/4	10	С	M	SCL		
	*	-						· : <del></del>	
	*			) <del></del>				* *************************************	
Type: C=Cc	oncentration, D=Dep	letion RM=R	educed Matrix CS	=Covered	or Coate	d Sand Gra	ins <sup>2</sup> l c	ocation: PL=Pore Lining, N	//=Matrix
ydric Soil I		ionom, rum r	iodaood maini, oc	0010100	or oodio	a oana ora		ators for Problematic H	
Histosol	(A1)		☐ Dark Surface	(S7)				2 cm Muck (A10) (MLRA 1	147)
	ipedon (A2)		Polyvalue Be	low Surfac				Piedmont Floodplain Soils	
Black His			Thin Dark Su			47, 148)		(MLRA 136, 147)	
	n Sulfide (A4)		Loamy Gleye		2)			Red Parent Material (TF2)	
	Layers (A5) ck (A10) <b>(LRR N)</b>		Depleted Mat		2)			Very Shallow Dark Surface	
	Below Dark Surface	- (Δ11)	Redox Dark S					Other (Explain in Remarks	)
	rk Surface (A12)	<i>(</i> ((()))	Redox Depre						
🗍 Sandy M	ucky Mineral (S1) (L	.RR N,	Iron-Mangan			LRR N,			
	147, 148)		MLRA 13	•					
	leyed Matrix (S4)		Umbric Surfa					dicators of hydrophytic veg	
	edox (S5) Matrix (S6)		Piedmont Flo	odplain So	ils (F19)	(MLRA 148		wetland hydrology must be unless disturbed or proble	
	ayer (if observed):							unless disturbed or problet	matic.
	,								
• • • • • • • • • • • • • • • • • • • •	hes):		_				Hydric Soi	il Present? Yes 🔀	No 🗀
Remarks:									

### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

WS

Project/Site: Triangle Expressway (A1X) City/County: W	/ake	Sampling Date: 3/8/2011
Applicant/Owner: N.C. Turnpike Authority	State: NC	Sampling Point: A1XWA101-I
Investigator(s): Mark L. Mickley, Mulkey, Inc. Section, Towns	hip, Range: Feltonville	camping round
	al relief (concave, convex, none):	None
Slope (%): 0% Lat: 35.678858 Long: -78.82	4126	Datum: NAD 83
Soil Map Unit Name: Wehadkee and Bibb soils		ation: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X		· — —
Are Vegetation, Soil, or Hydrology significantly disturbed?	Are "Normal Circumstances" p	
Are Vegetation, Soil, or Hydrology naturally problematic?	(If needed, explain any answe	rs in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing sampling p	oint locations, transects	, important features, etc.
Under Cail Dropant?	ampled Area Wetland? Yes	] No <u>×</u>
HYDROLOGY		
Wetland Hydrology Indicators:		tors (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil	` '
Surface Water (A1)  High Water Table (A2)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)	Drainage Pa	getated Concave Surface (B8)
Saturation (A3)  Oxidized Rhizospheres on Livin		
Water Marks (B1) Presence of Reduced Iron (C4)		Water Table (C2)
Sediment Deposits (B2)	Soils (C6) Crayfish Bur	rows (C8)
Drift Deposits (B3)		sible on Aerial Imagery (C9)
Algal Mat or Crust (B4)  Other (Explain in Remarks)		tressed Plants (D1)
Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7)	Shallow Aqu	Position (D2)
Water-Stained Leaves (B9)		phic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral	
Field Observations:		
Surface Water Present? Yes NoX Depth (inches):	_	
Water Table Present? Yes No Depth (inches):	-	
Saturation Present? Yes No X Depth (inches):	_ Wetland Hydrology Preser	it? Yes No X
(includes capillary fringe)  Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous insp	ections), if available:	
Remarks:		
No indicators		

## **VEGETATION** – Use scientific names of plants.

20.5	Absolute Dominant Indica	
Tree Stratum (Plot size: 30 ft )  1. Liriodendron tulipifera	% Cover Species? Stat 80 X FA	Number of Dominant Species _
3		Total Number of Dominant Species Across All Strata: 5 (B)
5		Percent of Dominant Species That Are OBL, FACW, or FAC:100% (A/B)
6.		Prevalence index worksheet:
7		
Sapling Stratum (Plot size: 15 ft )	80 = Total Cover	
Sapling Stratum (Plot size:15 ft)  1. Liriodendron tulipifera	10 X FA	OBL species x 1 =
2 Carpinus caroliniana		
3,		FACU species x 4 =
4		UPL species x 5 =
5		Column Totals: (A) (B)
6,		Prevalence Index = B/A =
7		
1E #	= Total Cover	Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size: 15 ft )		Rapid Test for Hydrophytic Vegetation
1.		Dominance Test is >50%
2,		Prevalence Index is ≤3.0¹
3,		Morphological Adaptations¹ (Provide supporting
4		data in Remarks or on a separate sheet)
5		Problematic Hydrophytic Vegetation¹ (Explain)
6		1
7.		Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
	= Total Cover	
Herb Stratum (Plot size: 5 ft )		Definitions of Vegetation Strata:
1. Microstegium vimineum	60 X FA	11ee - woody plants, excluding woody vines,
2		approximately 20 ft (6 m) or more in height and 3 in.
3		(7.6 cm) or larger in diameter at breast height (DBH).
4		Sapling – Woody plants, excluding woody vines,
5		approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
6		and to in. (7.0 only bbit.
7.		Shrub – Woody plants, excluding woody vines,
8		approximately 3 to 20 ft (1 to 6 m) in height.
9		Herb - All herbaceous (non-woody) plants, including
10		herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3
11=		ft (1 m) in height.
# =		
12	60 = Total Cover	Woody vine – All woody vines, regardless of height.
Woody Vine Stratum (Plot size: 30 ft	60 = Total Cover	
1 Smilax rotundifolia	5 X FA	
2.		<del></del> : []
2		
3		
3		— Hydrophytic
4		Vegetation
4 5	5 = Total Cover	Vegetation
4	- Total Gover	Vegetation
4 5	- Total Gover	Vegetation
4 5	- Total Gover	Vegetation
4 5	- Total Gover	Vegetation

### **SOIL**

Sampling Point: A1XWA101-Up

l	iption: (Describe t	o the depth n			or or confirm t	the abse	ence of indicato	ers.)	
Depth (inches)	Matrix Color (moist)	% C	Redox color (moist)	Features	Loc <sup>2</sup>	Textur	-0	Remarks	
0 - 12+	7.5 YR 4/6	100	olor (moist)		LOC	CSL		Remarks	
	7.0 110 470					COL	_		
// <u></u>									
5									
2.				·					
3.									
-									
r									
¹Type: C=Co	ncentration, D=Depl	etion RM=Red	uced Matrix CS	=Covered or Cos	eted Sand Grai	ins	<sup>2</sup> l ocation: Pl =	Pore Lining, M=I	Matrix
Hydric Soil In		ouon, run ruu	dood Midina, oo	0010100 01 000	atou Cana Gran			oblematic Hydr	
Histosol (	A1)		Dark Surface	(S7)				10) (MLRA 147	
	pedon (A2)		<del>-</del> -	ow Surface (S8)	(MLRA 147, 14	48)		odplain Soils (F	
Black His				face (S9) (MLRA	147, 148)		(MLRA 13		
	Sulfide (A4)	<u>_</u>	Loamy Gleye			Ļ	Red Parent N		
	Layers (A5)	<b> </b>	Depleted Mat			-		Dark Surface (T	F12)
	k (A10) <b>(LRR N)</b> Below Dark Surface	. (∆11) ⊨	Redox Dark S	ыласе (нь) к Surface (F7)		Ŀ	Uther (Explai	n in Remarks)	
	k Surface (A12)	(\( \)	Redox Depres						
	ucky Mineral (S1) (L	RR N,		ese Masses (F12	) (LRR N,				
MLRA	147, 148)		MLRA 136						
	eyed Matrix (S4)	<u>_</u>		ce (F13) (MLRA				drophytic vegeta	
Sandy Re		_	Piedmont Flo	odplain Soils (F1	9) <b>(MLRA 148)</b>	)	-	ology must be pr	
	Matrix (S6) ayer (if observed):						unless disturb	oed or problema	tic.
Type:	ayer (ii observed).								
Depth (incl		***************************************				Hudria	Soil Present?	Yes	No X
Remarks:	165).					пуапс	Son Fresent?	res	NO
No indicato	rs								
			*						

# WETLAND RATING WORKSHEET (4th VERSION)

WS

Project Name: TriEx Nearest Road: Sunset Lake Road Wetland Area (ac): 1.95 Name of Evaluator(s): Mark L. Mickley, Mulkey English	County: Wake Date: 3/8/2011 Wetland Width (ft): >100' ers & Consultants						
on sound or estusuary, pond or lake on perennial steam on intermittent stream within interstream divide other	ADJACENT LAND USE:  (within 1/2 mile upstream, upslope or radius)  X forested/natural vegetation A agricultural/ urbanized Adjacent Special Natural Areas  ADJACENT LAND USE:  60 % 30 % 10 %						
SOILS:  Soil Series: Wehadkee and Bibb soils predominantly organic (humus, muck or peat	DOMINANT VEGETATION:  1 Liriodendron tulipifera 2 Acer rubrum						
x predominantly mineral (non-sandy) predominantly sandy HYDRAULIC FACTORS:	3 Carpinus caroliniana 4 FLOODING AND WETNESS:						
X freshwater brackish steep topography ditched or channelized total wetland width >= 100 feet	semipermanently to permenently flooded or inundated seasonally flooded or inundated intermittently flooded or temporary surface water no evidence of flooding or surface water						
Swamp Forest E E Carolina Bay E Pocosin E	Bog/Fen Headwater Forest Bog Forest Ephemeral Wetland Other:						
* The rating system cannot be applied to salt and brackish marshes or stream channels.  DEM RATING							
WATER STORAGE 4	X 4 =16_						
BANK, SHORELINE STABILIZATION 4	x 4 = <u>16</u>						
POLLUTANT REMOVAI 4 *	X 5 = <u>20</u>						
WILDLIFE HABITAT 3	X 2 =6						
AQUATIC LIFE HABITAT	X 4 = 12						
RECREATION/EDUCATION1	X 1 =1						
Т	TOTAL WETLAND SCORE =71						

<sup>\*</sup> Add one point if in sensitive watershed and >10% nonpoint disturbance within 1/2 mile upstream, upslope, or radius.

### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

WBC

Project/Site: _Triangle Expressway (A4)	City/County: Wake Sampling Date: 4/7/2010
Applicant/Owner: N.C. Turnpike Authority	State: NC Sampling Point: A4WB001 WE
Investigator(s): Cindy Carr, Mulkey, Inc.	Section, Township, Range: Swift Creek
Landform (hillslope, terrace, etc.); sideslope	Local relief (concave, convex, none): concave
Slope (%): 0 - 4 Lat: 35.677083	Long:78.749077
Soil Map Unit Name: Colfax (Cn) sandy loam	NWI classification: PFO1
Are climatic / hydrologic conditions on the site typical for this time of	year? Yes X No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significant	ly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally p	problematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showin	ng sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present?  Hydric Soil Present?  Wetland Hydrology Present?  Remarks:	Is the Sampled Area within a Wetland? Yes No No
NCWAM - Bottomland Hardwood Forest	rea boundary. A4WB wetland extends across boundary; boundary is r.
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply  Surface Water (A1)  True Aquatic	
	Plants (B14)
	zospheres on Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1)	Reduced Iron (C4) Dry-Season Water Table (C2)
	Reduction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3)  Algel Met es Crust (B4)  Other (Finels)	
Algal Mat or Crust (B4)  Uron Deposits (B5)	n in Remarks)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No Depth (inche	
Water Table Present? Yes No Depth (inche	
Saturation Present? Yes X No Depth (inche (includes capillary fringe)	es):9 Wetland Hydrology Present? YesX No
Describe Recorded Data (stream gauge, monitoring well, aerial pho	otos, previous inspections), if available:
- D	
Remarks:	
Microtopographic depressions and drainageways.	
	8

## **VEGETATION** – Use scientific names of plants.

Sampling Point: A4WB001 WET1

20.4	Absolute	Dominant		Dominance Test worksheet:
Tree Stratum (Plot size:30 ft)	% Cover	Species?	Status	Number of Dominant Species
1, none				That Are OBL, FACW, or FAC:4 (A)
2,				Total Number of Deminent
3				Total Number of Dominant Species Across All Strata:  5 (B)
4				(5)
				Percent of Dominant Species
5				That Are OBL, FACW, or FAC:80 (A/B)
6				Prevalence Index worksheet:
7		$\square$		
45.0		= Total Cov	er	Total % Cover of: Multiply by:
Sapling Stratum (Plot size:15 ft)				OBL species x 1 =
1. Liriodendron tulipifera	30	X	FAC	FACW species x 2 =
2				FAC species x 3 =
3				FACU species x 4 =
4				UPL species x 5 =
				Column Totals: (A) (B)
5			-	Column Totals (A) (B)
6.				Prevalence Index = B/A =
7.º				
A.F. #	30	= Total Cov	er	Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size: 15 ft )				Rapid Test for Hydrophytic Vegetation
1. Rubus argutus	70	X	FACU	Dominance Test is >50%
2. Liriodendron tulipifera	30	X	FAC	Prevalence Index is ≤3.0 <sup>1</sup>
3. Arundinaria gigantea	10		FACW	Morphological Adaptations <sup>1</sup> (Provide supporting
				data in Remarks or on a separate sheet)
4.			-	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
5				
6,				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
7.				be present, unless disturbed or problematic.
F #4	110	= Total Cove	er	Definitions of Vegetation Strata:
Herb Stratum (Plot size: 5 ft )				Definitions of Vegetation Strata.
1. Schoenoplectus pungens (Scirpus pungens)	50	X	OBL	Tree – Woody plants, excluding woody vines,
2. Carex sp.	30			approximately 20 ft (6 m) or more in height and 3 in.
3. Solidago sp.	10			(7,6 cm) or larger in diameter at breast height (DBH).
4			-	Sapling – Woody plants, excluding woody vines,
		=		approximately 20 ft (6 m) or more in height and less
5.		=		than 3 in. (7.6 cm) DBH.
6	×			Shrub – Woody plants, excluding woody vines,
7.				approximately 3 to 20 ft (1 to 6 m) in height.
8				
9,				Herb - All herbaceous (non-woody) plants, including
10.				herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3
11.			7	ft (1 m) in height.
***************************************				
12				Woody vine – All woody vines, regardless of height.
Woody Vine Stratum (Plot size: 30 ft	90_	= Total Cove	er	
Woody Vine Stratum (Plot size:30 ft)   Lonicera japonica	80	$\square$	FAC	
			170	
2				
3				
4				Hydrophytic Vegetation
5				Present? Yes X No
	80	= Total Cove	or .	
		- Total Cove	<b>7</b> 1	
Remarks: (Include photo numbers here or on a separate	sheet.)			

SOIL

Sampling Point: A4WB001 WET1

Profile Desc	ription: (Describe	to the dept	h needed to docun	nent the i	ndicator	or confirm	the absence	of indicators.)
Depth	Matrix		Redo	x Features	3			
(inches)	Color (moist)	%	Color (moist)	<u>%</u>	Type <sup>1</sup>	_Loc <sup>2</sup>	<u>Texture</u>	Remarks
0-2	5 YR 3/3	80	5 YR 2.5/1	20	C	M	SiClay	
2 - 9	7.5 YR 4/1	70	5 YR 5/8	20	R	M	Clay	Oxydized rhizospheres
			10 YR 6/8	10	R	M, PL		Saturated at 9 inches
	-						-	
9 - 14	G4/N		5 VD 5/0	5		- NA	Clave	
9-14	G4/N	95	5 YR 5/8			M	Clay	
14 - 16	10 YR 8/1	100					Sand	
								-
( <del></del>		O					-	
1T C-C-		ation DM	D-dd M-t-b- OC			1010-	21	etian Di Bandician Maddi
Hydric Soil I	oncentration, D=Depl	etion, RM≃	Reduced Matrix, CS	=Covered	or Coate	a Sana Gra		ation: PL=Pore Lining, M=Matrix.  tors for Problematic Hydric Soils <sup>3</sup> :
-			Dork Surface	(07)				
Histosol	(A1) ipedon (A2)		Dark Surface Polyvalue Be		n (SR) /#	N RA 147		cm Muck (A10) <b>(MLRA 147)</b> edmont Floodplain Soils (F19)
Black His			Thin Dark Su			-	-	(MLRA 136, 147)
	n Sulfide (A4)		Loamy Gleye			147, 140,		ed Parent Material (TF2)
	Layers (A5)		☑ Depleted Mat		_,			ery Shallow Dark Surface (TF12)
	ck (A10) (LRR N)		Redox Dark S		6)			ther (Explain in Remarks)
	Below Dark Surface	e (A11)	Depleted Dar					
	rk Surface (A12)		Redox Depre	-	•			
	lucky Mineral (S1) (L	RR N,	Iron-Mangane		es (F12) <b>(</b>	LRR N,		
	147, 148)		MLRA 130	•	MI DA 42	C 400\	31	
	leyed Matrix (S4) edox (S5)		Umbric Surfa Piedmont Flo			•		cators of hydrophytic vegetation and etland hydrology must be present,
	Matrix (S6)		- Fleditionit Flo	oupiain St	טווס (ד וש)	(MILKA 14		eliand hydrology must be present, less disturbed or problematic.
	ayer (if observed):						T	ness distarbed of problematic.
Type:								l)
Depth (inc	hes).						Hydric Soil	Present? Yes X No
Remarks:							Tiyane oon	resent: res No
Remarks.								

# WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

WBC

Project/Site: _Triangle Expressway (A4)	City/County: Wake Sampling Date: 4/7/2010
Applicant/Owner: N.C. Turnpike Authority	State: NC Sampling Point: A4WB010 WE
Investigator(s): Cindy Carr, Mulkey, Inc.	Section, Township, Range: Swift Creek
Landform (hillslope, terrace, etc.): toe of slope	Local relief (concave, convex, none): convex
Slope (%): 0 - 2 Lat: 35.676730	Long: -78.748925 Datum: SP NAD83 feet
Soil Map Unit Name: Colfax (Cn) sandy loam	NWI classification: PFO1
Are climatic / hydrologic conditions on the site typical for this time of	of year? Yes X No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significa	antly disturbed?  Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology naturally	y problematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map show	ring sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present?  Hydric Soil Present?  Wetland Hydrology Present?  Yes X No Y	Is the Sampled Area within a Wetland? Yes X No
Remarks:	
NCWAM - Bottomland Hardwood Forest. Perennial streat Profile taken about 18 feet SW of A4WB010 and A4SA00	am A4SA is wetland boundary of A4WB along right side of channel. 04.
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that app	
	ic Plants (B14) Sparsely Vegetated Concave Surface (B8) Sulfide Odor (C1) Drainage Patterns (B10)
, , , , , , , , , , , , , , , , , , , ,	Sulfide Odor (C1) Urainage Patterns (B10) hizospheres on Living Roots (C3) Moss Trim Lines (B16)
	of Reduced Iron (C4)  Dry-Season Water Table (C2)
	Reduction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3)	Surface (C7) Saturation Visible on Aerial Imagery (C9)
	lain in Remarks) Stunted or Stressed Plants (D1)
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)  Water-Stained Leaves (B9)	Shallow Aquitard (D3)
Water-Stained Leaves (B9) Aquatic Fauna (B13)	☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)
Field Observations:	I Ac Hedital Test (55)
Surface Water Present? Yes No X Depth (incl	hes):
Water Table Present? Yes X No Depth (incl	
Saturation Present? Yes X No Depth (incl	hes): 6 Wetland Hydrology Present? Yes No No
(includes capillary fringe)  Describe Recorded Data (stream gauge, monitoring well, aerial pl	hotos, previous inspections), if available:
Remarks:	
upper floodplain on right side A4SA.	

Sampling Point: A4WB010 WET2

i	Absolute	Dominant Indic	ator Dominance Test worksheet:
Tree Stratum (Plot size:30 ft)	% Cover	Species? Sta	I Number of Dominant Species
1. Acer rubrum	40	X FA	C That Are OBL, FACW, or FAC:10 (A)
2. Liquidambar styraciflua	25	X FA	
3. Prunus serotina	5	FAC	Total Number of Dominant Species Across All Strata: 10 (B)
4. Quercus phellos	5	FAC	
5. Pinus taeda	5		Percent of Dominant Species  That Are OBL FACW or FAC: 100 (A/B)
6	-		That Are OBL, FACW, or FAC: (A/B)
	·		Prevalence Index worksheet:
7	80		
Sapling Stratum (Plot size:15 ft)		= Total Cover	OBL species x 1 =
1. Acer rubrum	40	X FA	
2. Liquidambar styraciflua	40	X FA	
*			
3			FACU species x 4 =
4		===	UPL species x 5 =
5			(A) (B)
6			Prevalence Index = B/A =
7			
200 to 200 to 1E ft	80	= Total Cover	Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size:15 ft)	720000		Rapid Test for Hydrophytic Vegetation
1. Acer rubrum		FA FA	
2. Liquidambar styraciflua	20	X FA	
3			
4	-		data in Remarks or on a separate sheet)
5			Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6			
7			Indicators of hydric soil and wetland hydrology must     be present, unless disturbed or problematic.
	40	= Total Cover	
Herb Stratum (Plot size:5 tt)			Definitions of Vegetation Strata:
Herb Stratum (Plot size: 5 ft )  1. Eulalia viminea (Microstegium vimineum)	40	X FA	Tree – Woody plants, excluding woody vines,
Herb Stratum (Plot size: 5 ft )  1. Eulalia viminea (Microstegium vimineum)  2. Polystichum acrostichoides	40		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in.
1. Eulalia viminea (Microstegium vimineum)		X FA	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in.  (7.6 cm) or larger in diameter at breast height (DBH)
Eulalia viminea (Microstegium vimineum)     Polystichum acrostichoides     Juncus effusus	10 5	X FA	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines,
Eulalia viminea (Microstegium vimineum)     Polystichum acrostichoides     Juncus effusus 4.	10 5	X FA	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less
1. Eulalia viminea (Microstegium vimineum) 2. Polystichum acrostichoides 3. Juncus effusus 4. 5.	10 5	X FA	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines,
1. Eulalia viminea (Microstegium vimineum) 2. Polystichum acrostichoides 3. Juncus effusus 4 5 6	10 5	X FA	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines,
1. Eulalia viminea (Microstegium vimineum) 2. Polystichum acrostichoides 3. Juncus effusus 4	10 5	X FA	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
1. Eulalia viminea (Microstegium vimineum) 2. Polystichum acrostichoides 3. Juncus effusus 4	10 5	X FA	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
1. Eulalia viminea (Microstegium vimineum) 2. Polystichum acrostichoides 3. Juncus effusus 4	10 5	X FA	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody
1. Eulalia viminea (Microstegium vimineum) 2. Polystichum acrostichoides 3. Juncus effusus 4	10 5	X FA	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3
1. Eulalia viminea (Microstegium vimineum) 2. Polystichum acrostichoides 3. Juncus effusus 4	10 5	X FA	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody
1. Eulalia viminea (Microstegium vimineum) 2. Polystichum acrostichoides 3. Juncus effusus 4	10 5	X FA	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3
1. Eulalia viminea (Microstegium vimineum) 2. Polystichum acrostichoides 3. Juncus effusus 4	10 5	X FA	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
1. Eulalia viminea (Microstegium vimineum) 2. Polystichum acrostichoides 3. Juncus effusus 4.	10 5	X FA X FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.
1. Eulalia viminea (Microstegium vimineum) 2. Polystichum acrostichoides 3. Juncus effusus 4	10 5	X FA	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.
1. Eulalia viminea (Microstegium vimineum) 2. Polystichum acrostichoides 3. Juncus effusus 4		X FA X FA FAC  Total Cover  X FA	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.
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SOIL Sampling Point: A4WB010 WET2

	Depth	cription: (Describe	the dept		k Features		51 <b>00</b> 1111111	tile absence	of maleators.,
2 - 16  10 YR 3/1  95  5 YR 5/8  5  C  PL  SaClay oxydized rhizospheres few gravel at 2 inches saturated at 6 inches water in hole at 8 inches  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Hydric Soil Indicators:  Histosol (A1)	(inches)			Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	<u>Texture</u>	Remarks
Few gravel at 2 inches   saturated at 6 inches   water in hole at 8 inches   water i	0 - 2	7.5 YR 2.5/1			-			SiClay	fine roots
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.   PL=Pore Lining, M=Matrix.   Indicators for Problematic Hydric Soils <sup>3</sup> :   Indicators of Hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.   Indicators for Problematic Hydric Soil Present?   Indicators for Problematic Hydric Soils Present?   Indicators for Problematic Hydric	2 - 16	10 YR 3/1	95	5 YR 5/8	5		PL	SaClay	oxydized rhizospheres
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion Reductor Solis (F19) (MLRA 145, 148)  Type: C=Concentration, Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration Reductor Solis (F19) (MLRA 147, 148)  Thickosol (A10) (MLRA 147, 14		*			: <del></del> :				
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration, D=Depletion Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration Matrix, CS=Covered or Coated Sand Grains.  Type: C=Concentration Matrix, CS=Concentration Matrix, 148)  Thick Dark Surface (S1) (MLRA 147, 148)  Th	7.								
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.  Hydric Soil Indicators:  Histosol (A1)  Histic Epipedon (A2)  Black Histic (A3)  Thin Dark Surface (S9) (MLRA 147, 148)  Hydrogen Sulfide (A4)  Stratified Layers (A5)  Depleted Matrix (F3)  Depleted Below Dark Surface (F6)  Depleted Below Dark Surface (A11)  Thick Dark Surface (A12)  Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)  MLRA 147, 148)  Mura 147, 148)  Sandy Redox (S5)  Sestrictive Layer (if observed):  Type:  Depth (inches):  Hydric Soil Present? Yes X No					-				
Histosol (A1)									water in flore at 6 mones
Histosol (A1)									
Histosol (A1)									
Histosol (A1)  Histic Epipedon (A2)  Black Histic (A3)  Hydrogen Sulfide (A4)  Stratified Layers (A5)  Depleted Below Dark Surface (A11)  Thick Dark Surface (A12)  Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)  Sandy Redox (S5)  Stripped Matrix (S4)  Stripped Matrix (S6)  Stripped Matrix (S6)  Depleted Layer (if observed):  Type:  Depth (inches):  Dark Surface (S7)  Polyvalue Below Surface (S8) (MLRA 147, 148)  Polyvalue Below Surface (S8) (MLRA 147, 148)  Piedmont Floodplain Soils (F19)  (MLRA 136, 147)  Red Parent Material (TF2)  Very Shallow Dark Surface (TF12)  Other (Explain in Remarks)  Other (Explain in Remarks)  Iron-Manganese Masses (F12) (LRR N, MLRA 136, 122)  Stripped Matrix (S6)  Redox Depressions (F8)  Iron-Manganese Masses (F12) (LRR N, MLRA 136, 122)  Piedmont Floodplain Soils (F19) (MLRA 148)  Wetland hydrology must be present, unless disturbed or problematic.  Hydric Soil Present? Yes No			etion, RM=	Reduced Matrix, CS	=Covered	or Coate	d Sand Gra		
Sandy Gleyed Matrix (S4)  Sandy Redox (S5)  Stripped Matrix (S6)  Restrictive Layer (if observed):  Type:  Depth (inches):  Umbric Surface (F13) (MLRA 136, 122)  Piedmont Floodplain Soils (F19) (MLRA 148)  Wetland hydrology must be present, unless disturbed or problematic.  Wetland hydrology must be present, unless disturbed or problematic.  Hydric Soil Present? Yes No	Histosol Histic Ep Black Hi Hydroge Stratified 2 cm ML Depleted Thick Da Sandy M	(A1) pipedon (A2) stic (A3) on Sulfide (A4) d Layers (A5) lick (A10) (LRR N) d Below Dark Surface ark Surface (A12) fucky Mineral (S1) (L		Polyvalue Bel Thin Dark Sul Loamy Gleye Depleted Mat Redox Dark S Depleted Dar Redox Depre	ow Surface rface (S9) d Matrix (F rix (F3) Surface (F6 k Surface sssions (F8 sse Masse	(MLRA 1 52) 5) (F7)	47, 148)	148)	cm Muck (A10) (MLRA 147) Piedmont Floodplain Soils (F19) (MLRA 136, 147) Red Parent Material (TF2) (Yery Shallow Dark Surface (TF12)
Restrictive Layer (if observed):  Type:  Depth (inches): Hydric Soil Present? Yes X No	Sandy G	Bleyed Matrix (S4)		Umbric Surfac	ce (F13) <b>(F</b>				
Type:								u	nless disturbed or problematic.
Depth (inches): Hydric Soil Present? Yes X No		_ayer (if observed):							
		shoe).		_				Hudria Call	Brocont2 Voc X No
		леs)						nyaric Soil	Present? Fes LAL NO LL
	rtomants.								

### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont;

WBC

Project/Site: _Triangle Expressway (A4)	City/County: Wake Sampling Date: 4/7/2010
Applicant/Owner: N.C. Turnpike Authority	State: NC Sampling Point: A4WB001 UP1
Investigator(s): Cindy Carr, Mulkey, Inc.	Section, Township, Range: Swift Creek
Landform (hillslope, terrace, etc.): midslope	Local relief (concave, convex, none): Convex
Slope (%): 2 - 4 Lat: 35.677093	Long: -78.749179 Datum: SP NAD83 feet
Soil Map Unit Name: Colfax (Cn) sandy loam	NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of ye	
Are Vegetation, Soil, or Hydrology significantly	· — — — — — — — — — — — — — — — — — — —
Are Vegetation, Soil, or Hydrology naturally pr	
SUMMARY OF FINDINGS – Attach site map showing	g sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present?	Is the Sampled Area
Hydric Soil Present? Yes No X	within a Wetland?
Wetland Hydrology Present? Yes NoX	
Remarks:	
Profile taken about 8 feet W of A4WB001. Wetland bounda	ry is open and extends across north and south study area boundaries.
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
Surface Water (A1)	
High Water Table (A2)  Hydrogen Sulf	
Saturation (A3) Oxidized Rhizo	ospheres on Living Roots (C3) Moss Trim Lines (B16)
Water Marks (B1) Presence of R	educed Iron (C4)
	eduction in Tilled Soils (C6) Crayfish Burrows (C8)
Drift Deposits (B3)	
Algal Mat or Crust (B4)  Uron Deposits (B5)  Other (Explain	
Inundation Visible on Aerial Imagery (B7)	Geomorphic Position (D2) Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No X Depth (inches	s):
Water Table Present? Yes No X Depth (inches	s):
	s): Wetland Hydrology Present? Yes No X
(includes capillary fringe)  Describe Recorded Data (stream gauge, monitoring well, aerial phot	os, previous inspections), if available:
Remarks:	

## **VEGETATION** – Use scientific names of plants.

Sampling Point: A4WB001 UP1

00.0	Absolute [	Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:30 ft)	% Cover	Species? Status	Number of Dominant Species
1. none			That Are OBL, FACW, or FAC:4 (A)
2	L		Total Number of Dominant
3			Species Across All Strata: 5 (B)
4			
			Percent of Dominant Species That Are ORL FACW or FAC: 80 (A/B)
5			That Are OBL, FACW, or FAC:80 (A/B)
6			Prevalence Index worksheet:
7			Total % Cover of: Multiply by:
15.6	=	Total Cover	
Sapling Stratum (Plot size: 15 ft )	ac E	V ] 540	OBL species x 1 =
Liquidambar styraciflua	15	X FAC	FACW species x 2 =
2. Pinus taeda	5	FAC	FAC species x 3 =
3. Liriodendron tulipifera	40 L	X FAC	FACU species x 4 =
4			UPL species x 5 =
5			Column Totals: (A) (B)
6			.,,
			Prevalence Index = B/A =
7,	<u>-</u>	T.1.10	Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size: 15 ft )	=	Total Cover	Rapid Test for Hydrophytic Vegetation
1. Rubus argutus	70 Г	X FACU	Dominance Test is >50%
o Liquetrum einenee	15	FAC	Prevalence Index is ≤3.0¹
3			Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
4			
5	L		Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6			
7			Indicators of hydric soil and wetland hydrology must
	85 =		be present, unless disturbed or problematic.
		Lotal Cover	
Herb Stratum (Plot size: 5 ft )	=	Total Cover	Definitions of Vegetation Strata:
Herb Stratum (Plot size: 5 ft )  1. Schoenoplectus pungens (Scirpus pungens )	20	Total Cover  OBL	
1. Schoenoplectus pungens (Scirpus pungens)	20		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in.
Schoenopiectus pungens (Scirpus pungens )   2	20		Tree – Woody plants, excluding woody vines,
Schoenopiectus pungens (Scirpus pungens )     .     .     .     .     .	20		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Schoenopiectus pungens (Scirpus pungens )      Scirpus pungens (Scirpus pungens )      Scirpus pungens (Scirpus pungens )      Scirpus pungens (Scirpus pungens )	20		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in.
Schoenopiectus pungens (Scirpus pungens)      .	20 [		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines,
Schoenopiectus pungens (Scirpus pungens )      Scirpus pungens (Scirpus pungens )      Scirpus pungens (Scirpus pungens )      Scirpus pungens (Scirpus pungens )	20 [		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
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Sampling Point: A4WB001 UP1

Profile Des	cription: (Describe t	to the dept				or confirn	n the absence	of indicate	ors.)	
Depth	Matrix			x Features						
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	_Loc <sup>2</sup>	Texture		Remarks	
0-3	7.5 YR 4/4	100					SaClay		fine roots	
3 - 6	2.5 Y 5/3	90	7.5 YR 5/8	10	С		Clay		few gravel	
			:							
									farri anarral	
6 - 14	7,.5 YR 5/6	90	7.5 YR 7/8	15		M	Clay	-	few gravel	
			7.5 YR 5/8	15	C	M				
R										
·——							·			
s							; <del></del>			
¹Type: C=C	oncentration, D=Depl	etion, RM=	Reduced Matrix, CS	S=Covered	or Coate	d Sand Gr	rains. <sup>2</sup> Loc	ation: PL=	Pore Lining, M=M	atrix.
	Indicators:						Indica	tors for P	roblematic Hydric	c Soils³:
Histosol			Dark Surface	(S7)					A10) (MLRA 147)	i i
	pipedon (A2)		Polyvalue Be		ce (S8) <b>(N</b>	ILRA 147.		•	oodplain Soils (F19	9)
	istic (A3)		Thin Dark Su					(MLRA 13		·
	en Sulfide (A4)		Loamy Gleye						Material (TF2)	
	d Layers (A5)		Depleted Mat		,				v Dark Surface (TF	12)
	uck (A10) (LRR N)		Redox Dark S		6)				in in Remarks)	, I
-	d Below Dark Surface	e (A11)	Depleted Dar				_	` '	,	
	ark Surface (A12)	,	Redox Depre							
	Mucky Mineral (S1) (L	RR N.	Iron-Mangan			LRR N,				
	A 147, 148)	,	MLRA 13							
	Gleyed Matrix (S4)		Umbric Surfa		MLRA 13	6, 122)	3Indi	cators of h	ydrophytic vegetat	tion and
	Redox (S5)		Piedmont Flo						rology must be pre	
	d Matrix (S6)				(*)	(	-	_	bed or problemation	
	Layer (if observed):						1			
Type:										
	ahaa)i						Usadaia Cail	D42	Van I	10 X
Depth (in	cnes):						Hydric Soil	Present?	YesN	ا بکا ۱۵
Remarks:										
										) h

### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

WBC

Project/Site: _Triangle Expressway (A4)	City/County: Wake	Sampling Date: <u>4/7/2010</u>
Applicant/Owner: N.C. Turnpike Authority		Sampling Point: A4WB010
Investigator(s): Cindy Carr, Mulkey, Inc.	Section, Township, Range: Swift Creek	
Landform (hillslope, terrace, etc.): sideslope	Local relief (concave, convex, none)	convex
Slope (%): 0 - 4 Lat: 35.676741	Long: -78.749015	Datum: SP NAD83 feet
Soil Map Unit Name: Colfax (Cn) sandy loam	NWI classific	
Are climatic / hydrologic conditions on the site typical for this time of ye	· · · · · · · · · · · · · · · · · · ·	
Are Vegetation, Soil, or Hydrology significantly		
Are Vegetation , Soil , or Hydrology naturally pri		
SUMMARY OF FINDINGS – Attach site map showing		·
		,
Hydrophytic Vegetation Present?  Hydric Soil Present?  Yes X No Yes No X	Is the Sampled Area	
Hydric Soil Present?  Wetland Hydrology Present?  Yes No X  No X	within a Wetland? Yes	No <u></u>
Remarks:		
Profile taken about 3 feet SW of A4WB010. Adjacent to A4	SA unner floodolain slone	
Trome taken about 3 feet 300 of A40000 to. Adjacent to A40	on, upper modificant slope,	
HYDROLOGY		
Wetland Hydrology Indicators:	Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil	Cracks (B6)
Surface Water (A1)		getated Concave Surface (B8)
High Water Table (A2)  Hydrogen Sulfi		
	ospheres on Living Roots (C3) Moss Trim Leduced Iron (C4) Dry-Season	water Table (C2)
	eduction in Tilled Soils (C6) Crayfish Bur	
Drift Deposits (B3)		isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	in Remarks) Stunted or S	tressed Plants (D1)
Iron Deposits (B5)		Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aqu	· · · · · · · · · · · · · · · · · · ·
Water-Stained Leaves (B9)  Aquatic Fauna (B13)	Microtopogra  FAC-Neutral	aphic Relief (D4)
Field Observations:	FAC-Neutral	1681 (D3)
	):	
	):	
Saturation Present? Yes No X Depth (inches		nt? Yes No X
(includes capillary fringe)  Describe Recorded Data (stream gauge, monitoring well, aerial photo		
Describe Necorded Data (stream gauge, monitoring well, aeriai priote	os, previous inspections), ii available.	
Remarks:		

### **VEGETATION** – Use scientific names of plants.

Sampling Point: A4WB010 UP2

	Absolute	Dominan	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 ft )		Species'		
. Dinus toodo	5	X	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)
**************************************			-	matrie obc, i now, or no(A)
2				Total Number of Dominant
3				Species Across All Strata: 7 (B)
4				
				Percent of Dominant Species That Are ORL EACW or EAC: 100 (A/R)
5				That Are OBL, FACW, or FAC: 100 (A/B)
6				Brownlance Index weather etc
7,				Prevalence Index worksheet:
	5	= Total Co	ver	Total % Cover of: Multiply by:
Sapling Stratum (Plot size:15 ft)		10101 00		OBL species x 1 =
. Dinun toodo	30	X	FAC	FACW species x 2 =
· · · · · · · · · · · · · · · · · · ·				
2				FAC species x 3 =
3				FACU species x 4 =
4				UPL species x 5 =
			4	Column Totals: (A) (B)
5				Column Totals (A) (B)
6				Prevalence Index = B/A =
7				
A10.	30	= Total Co	ver	Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size:15 ft)		10.0100		Rapid Test for Hydrophytic Vegetation
1 Pinus taeda	10		FAC	Dominance Test is >50%
1 · · · · · · · · · · · · · · · · · · ·	40	×	FAC	Prevalence Index is ≤3.0¹
2. Acer rubrum				
3. Liquidambar styraciflua	40	X	FAC	Morphological Adaptations <sup>1</sup> (Provide supporting
4				data in Remarks or on a separate sheet)
		***************************************		Problematic Hydrophytic Vegetation¹ (Explain)
5,		_		
6.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
7				be present, unless disturbed or problematic.
				po present, unless disturbed of problematic.
	90	= Total Co	VOT	
£ #	90	≃ Total Co	ver	Definitions of Vegetation Strata:
Herb Stratum (Plot size:5 ft)	90	≃ Total Co	ver FAC	Definitions of Vegetation Strata:
Herb Stratum (Plot size: 5 ft )  1. Polystichum acrostichoides	5	= Total Co		Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines,
Herb Stratum (Plot size:5 ft)	5	≃ Total Co		Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in.
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Herb Stratum (Plot size: 5 ft )  1. Polystichum acrostichoides  2  3	5	= Total Co		Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines,
Herb Stratum (Plot size:5 ft)  1. Polystichum acrostichoides  2  3  4	5	= Total Co		Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less
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Herb Stratum (Plot size:5 ft) 1. Polystichum acrostichoides 2 3 4 5 6 7 8 9 10 11	5		FAC	Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3
Herb Stratum (Plot size:5 ft)  1. Polystichum acrostichoides  2  3  4  5  6  7  8  9  10  11  12	5	= Total Co	FAC	Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Herb Stratum (Plot size:5 ft)  1. Polystichum acrostichoides  2  3  4  5  6  7  8  9  10  11  12  Woody Vine Stratum (Plot size:30 ft)	5		FAC	Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Herb Stratum (Plot size: 5 ft )  1. Polystichum acrostichoides  2	5 5 30	X   X   X   X   X   X   X   X   X   X	FAC	Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Herb Stratum (Plot size:5 ft)  1. Polystichum acrostichoides  2  3  4  5  6  7  8  9  10  11  12  Woody Vine Stratum (Plot size:30 ft)  1. Smilax rotundifolia  2. Lonicera japonica	5 		FAC FAC FAC	Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Herb Stratum (Plot size:5 ft)  1. Polystichum acrostichoides  2  3  4  5  6  7  8  9  10  11  12  Woody Vine Stratum (Plot size:30 ft)  1. Smilax rotundifolia	5 5 30	X   X   X   X   X   X   X   X   X   X	FAC	Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Herb Stratum (Plot size: 5 ft )  1. Polystichum acrostichoides  2	5 	X   X   X   X   X   X   X   X   X   X	FAC FAC FAC	Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.
Herb Stratum (Plot size: 5 ft )  1. Polystichum acrostichoides  2	5 	X   X   X   X   X   X   X   X   X   X	FAC FAC FAC	Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
Herb Stratum (Plot size: 5 ft )  1. Polystichum acrostichoides  2	5 	= Total Co	FAC FAC FAC	Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.
Herb Stratum (Plot size: 5 ft )  1. Polystichum acrostichoides  2	5 	X   X   X   X   X   X   X   X   X   X	FAC FAC FAC	Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
Herb Stratum (Plot size:	5 	= Total Co	FAC FAC FAC	Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
Herb Stratum (Plot size:	5 	= Total Co	FAC FAC FAC	Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
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Herb Stratum (Plot size:	5 	= Total Co	FAC FAC FAC	Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
Herb Stratum (Plot size:	5 	= Total Co	FAC FAC FAC	Definitions of Vegetation Strata:  Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation

SOIL

Sampling Point: A4WB010 UP2

Profile Desc	cription: (Describe t	to the depth	n needed to docur	nent the i	ndicator	or confirm	the absenc	e of indicato	ors.)
Depth	Matrix			x Features	S1	1 2	T4		Damada
(inches) 0 - 1	Color (moist) 7,5 YR 3/3	100	Color (moist)	%	Type <sup>1</sup>	_Loc <sup>2</sup>	<u>Texture</u> SaClaLm	_	Remarks fine roots
1 - 8								-	many gravel
	10 YR 4/4	100 -					SaClaLm		
8 - 12	2.5 Y 4/3	100					SaClaLm		many gravel
								-	
		-			-		-		-
							•		
¹Tupo: C=C	oncentration, D=Depl	otion DM-E	Poducod Motriy CS			d Sand Cr	roine 21	DI -	Pore Lining, M=Matrix.
Hydric Soil		elion, Kivi-r	Reduced Matrix, Co	s-Covered	or Coate	u Sanu Gr			oblematic Hydric Soils <sup>3</sup> :
Histosol			Dark Surface	(S7)					A10) (MLRA 147)
	oipedon (A2)		Polyvalue Be		ce (S8) <b>(M</b>	LRA 147,			oodplain Soils (F19)
	stic (A3)		Thin Dark Su		-	47, 148)		(MLRA 13	
	en Sulfide (A4)		Loamy Gleye		F2)				Material (TF2)
	d Layers (A5) uck (A10) <b>(LRR N)</b>		Depleted Ma Redox Dark		·6/				Dark Surface (TF12) in in Remarks)
	d Below Dark Surface	e (A11)	Depleted Da					Otriei (Explai	iii iii Neillaiks)
	ark Surface (A12)	. ( ,	Redox Depre		. ,				
	lucky Mineral (S1) <b>(L</b>	RR N,	Iron-Mangan		es (F12) (I	RR N,			
	A 147, 148)		MLRA 13				3,		
	Gleyed Matrix (S4) Redox (S5)		Umbric Surfa					-	drophytic vegetation and ology must be present,
	Matrix (S6)		Fleditiont Fit	ouplain St	ulis (F 1 <del>3</del> )	(MILIXA 14	-	_	bed or problematic.
	Layer (if observed):								
Type:			_						
Depth (in	ches):						Hydric So	il Present?	Yes No X
Remarks:									

# WETLAND RATING WORKSHEET (4th VERSION)

WBC

Project Name: Nearest Road: Wetland Area (ac): Name of Evaluator(s):  Southeastern Con West Lake Road, 3.8  Cindy Carr, Mo	Oxford Green Roa	d Da	ounty: ite: etland Width		Wake 4/7/2010 > 100 feet
on sound or estusuary, pond or on perennial steam on intermittent stream within interstream divide other		(within 1)  X for X ag X im		eam, upslope or rac il vegetation banized face	flus)
Soil Series: Appling (AgC2) Soil Series: Colfax (Cn), Worsham predominantly organic (humus predominantly mineral (non-sapedominantly sandy  HYDRAULIC FACTORS:	s, muck or peat)	1 <u>Lin</u> 2 <u>Ru</u> 3 <u>Ac</u> 4 <u>Ro</u>	ANT VEGE riodendron to bus argutus er rubrum sa multiflora	ulipifera a	
X freshwater brackish steep topography ditched or channelized total wetland width >= 100 fee  WETLAND TYPE: (select one)*	rt	X int	isonally floo ermittently f	tly to permenently f ded or inundated looded or temporar flooding or surface	Tooded or inundated y surface water water
X Bottomland Hardwood Forest Swamp Forest Carolina Bay Pocosin Pine Savannah Freshwater Marsh  * The rating system cannot be applied to	Bog l Ephe Other	water Fores Forest meral Wetla	ınd	nels.	
DEM RATING					
WATER STORAGE	2	X	4 =	8	
BANK, SHORELINE STABILIZATIO	2	X	4 =	8	*:
POLLUTANT REMOVAL	*	X	5 #	10	ec
WILDLIFE HABITA	5	X	2 =	10	e)
AQUATIC LIFE HABITAT	3	Х	4 =	12	•
RECREATION/EDUCATION	1		l = .ND SCORE	1 49	9

<sup>\*</sup> Add one point if in sensitive watershed and >10% nonpoint disturbance within 1/2 mile upstream, upslope, or radius.

#### WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont (

WBZ

Project/Site: Triangle Expressway (A6)	City/County: Wake	Sampling Date: 3/24/2010
Applicant/Owner: N.C. Turnpike Authority		State: NC Sampling Point: Wet A6WD008
Investigator(s): Thomas Barrett, Mulkey, Inc.	Section, Township, Range: _Mc(	Culler's Crossroads
Landform (hillslope, terrace, etc.): floodplain		convex, none): concave
Slope (%): 0 Lat: 35.654611	Long:78.701803	Datum: NAD 83
Soil Map Unit Name: Wehadkee and Bibb Soils		NWI classification: PFO1
Are climatic / hydrologic conditions on the site typical for this time o	f year? Yes X No (If r	no, explain in Remarks.)
		rcumstances" present? Yes X No
	-	lain any answers in Remarks.)
SUMMARY OF FINDINGS — Attach site map show	•	•
		s, transects, important reatures, etc.
Hydrophytic Vegetation Present? Yes X No X	Is the Sampled Area	
Hydric Soil Present?  Wetland Hydrology Present?  Yes X No Yes X N	within a Wetland?	Yes X No No
Remarks:	<u>-</u>	
NOWARA Pottorsland Upratured Forest		
NCWAM - Bottomland Hardwood Forest		
HYDROLOGY		
Wetland Hydrology Indicators:	Se	condary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that app	ly)	Surface Soil Cracks (B6)
	c Plants (B14)	Sparsely Vegetated Concave Surface (B8)
	ulfide Odor (C1)	Drainage Patterns (B10)
	izospheres on Living Roots (C3)	Moss Trim Lines (B16)
	Reduced Iron (C4)	Dry-Season Water Table (C2)
Sediment Deposits (B2)  Drift Deposits (B3)  Recent Iron  Thin Muck S	Reduction in Tilled Soils (C6)	Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9)
	ain in Remarks)	Stunted or Stressed Plants (D1)
Iron Deposits (B5)		Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)		Shallow Aquitard (D3)
Water-Stained Leaves (B9)		Microtopographic Relief (D4)
Aquatic Fauna (B13)	×	FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes No Depth (Inch		
Water Table Present? Yes No Depth (inch	· · · · · · · · · · · · · · · · · · ·	
Saturation Present? Yes X No Depth (includes capillary fringe)	es): wetland Hyd	rology Present? Yes X No No
Describe Recorded Data (stream gauge, monitoring well, aerial ph	otos, previous inspections), if availab	le:
Remarks:		
Nomana.		

#### **VEGETATION** – Use scientific names of plants.

00.6	Absolute	Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:30 ft)	% Cover		Number of Dominant Species
1. Ulmus americana	10	FACW	That Are OBL, FACW, or FAC:5 (A)
2. Acer rubrum	50	X FAC	T. (1) (5)
3. Liriodendron tulipifera	10	FAC	Total Number of Dominant Species Across All Strata:  5 (B)
	. —		Opedies Across All Strata.
4		==-	Percent of Dominant Species
5		==-	That Are OBL, FACW, or FAC: 100 (A/B)
6.			Prevalence Index worksheet:
7			
	70	= Total Cover	Total % Cover of: Multiply by:
Sapling Stratum (Plot size:15 ft)			OBL species x 1 =
1. Ligustrum sinense	20	X FAC	FACW species x 2 =
2.	0)11		FAC species x 3 =
3			FACU species x 4 =
			UPL species x 5 =
4			
5,			Column Totals: (A) (B)
6.			Prevalence Index = B/A =
7.11			
	20	= Total Cover	Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size: 15 ft )			Rapid Test for Hydrophytic Vegetation
1. Not Applicable			Dominance Test is >50%
2,			Prevalence Index is ≤3.0 <sup>1</sup>
3			Morphological Adaptations <sup>1</sup> (Provide supporting
			data in Remarks or on a separate sheet)
4,			Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
5			
6,			<sup>1</sup> Indicators of hydric soil and wetland hydrology must
7,			be present, unless disturbed or problematic.
		= Total Cover	
Herb Stratum (Plot size: 5 ft )			Definitions of Vegetation Strata:
1. Arundinaria gigantea	40		
1. Aranamana yiyantea	10	X FACW	Tree – Woody plants, excluding woody vines,
		X FACW	approximately 20 ft (6 m) or more in height and 3 in.
2.		X FACW	
2		X FACW	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
2		X FACW	approximately 20 ft (6 m) or more in height and 3 in.
2		X FACW	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines,
2		X FACW	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
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2		X FACW	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
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2		X FACW	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody
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2		X FACW	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
2			approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3
2		X FACW	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
2		Total Cover	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
2	10	Total Cover  TABLE FAC	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
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SOIL

Sampling Point: Wet A6WD008

	Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)									
Depth (inches)	Matrix Color (moist)	%	Redo Color (moist)	ox Feature %	s _Type <sup>1</sup>	Loc²	Texture		Remarks	
0 - 4	10 YR 3/2	100	Color (moist)			LUC	Clay loam	Ox	idized rhizosp	heres
4 - 12+	10 YR 4/2	80	10 YR 3/6	20	C	M			idizod i i iizoop	-
4 - 12+			10 113/0			IVI	Silty Clay			
					**					-
							-	-		
¹Type: C=Co	ncentration, D≃Depl	letion, RM=Re	educed Matrix, C	S=Covered	d or Coate	ed Sand Gr	ains. <sup>2</sup> Lo	cation: PL=	Pore Lining, M	=Matrix.
Hydric Soil II									roblematic Hyd	
Histosol (	A1)		Dark Surface	e (S7)				2 cm Muck (/	A10) <b>(MLRA 14</b>	7)
Histic Epi	pedon (A2)		Polyvalue B	elow Surfa	ce (S8) (N	ILRA 147,	148)	Piedmont Flo	oodplain Soils (l	F19)
Black His			Thin Dark S			147, 148)		(MLRA 13		
	Sulfide (A4)		Loamy Gley	•	(F2)				Material (TF2)	
	Layers (A5)		Depleted Ma		-6)				/ Dark Surface	(TF12)
	ck (A10) <b>(LRR N)</b> Below Dark Surface	- (A11)	Redox Dark Depleted Da					Otner (Expla	in in Remarks)	
	k Surface (A12)	, (711)	Redox Depr							
	ucky Mineral (S1) (L	.RR N,	🔲 Iron-Mangar	•	•	LRR N,				
	147, 148)		MLRA 13							
	eyed Matrix (S4)		Umbric Surfa						ydrophytic vege	
	edox (S5)		Piedmont Flo	oodplain S	ioils (F19)	(MLRA 14			ology must be p	
	Matrix (S6) ayer (if observed):						, ·	uniess distur	bed or problem	atic.
Type:	ayer (ii observed).									
Depth (incl			-				Hydria Sai	il Present?	Yes X	No 🗔
Remarks:	103)						Tiyane 30	ii r reseiit?	169	140
Temarks.										

#### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

WBZ

Project/Site: Triangle Expressway (A6)	City/County: Wake Sampling Date: 3/24/2010
Applicant/Owner: N.C. Turnpike Authority	State: NC Sampling Point: UP A6WD009
Investigator(s): Thomas Barrett, Mulkey, Inc.	Section, Township, Range: McCuller's Crossroads
Landform (hillslope, terrace, etc.); hillslope	Local relief (concave, convex, none): Convex
Slope (%): 0 - 1 Lat: 35.654308	Long:78.701685
Soil Map Unit Name: Wehadkee and Bibb Soils	NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of y	
Are Vegetation, Soil, or Hydrology significantl	
, , , , ,	
SUMMARY OF FINDINGS – Attach site map showin	g sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes X No	Is the Sampled Area
Hydric Soil Present? Yes No X	within a Wetland? Yes No X
Wetland Hydrology Present? Yes NoX	<u></u>
Remarks:	
Upland data point lies directly between wetlands A6WD and	d A6WE and is used for both wetlands.
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1)	Plants (B14) Sparsely Vegetated Concave Surface (B8)
	lfide Odor (C1)
	zospheres on Living Roots (C3) Moss Trim Lines (B16)
	Reduced Iron (C4)
Sediment Deposits (B2)  Drift Deposits (B3)  Recent Iron R  Thin Muck Su	Reduction in Tilled Soils (C6) Crayfish Burrows (C8)
Algal Mat or Crust (B4)  Other (Explain	
Iron Deposits (B5)	Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	
	s):
	is):
Saturation Present? Yes NoX Depth (inchest (includes capillary fringe)	S): Wetland Hydrology Present? Yes No No
Describe Recorded Data (stream gauge, monitoring well, aerial pho	tos, previous inspections), if available:
Remarks:	
No obvievo budrelogio indicatore	
No obvious hydrologic indicators.	

## **VEGETATION** – Use scientific names of plants.

	Absolute	Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:30 ft)	% Cover		Number of Dominant Species
1 Liriodendron tulipifera	10	FAC	That Are OBL, FACW, or FAC:5 (A)
2 Quercus nigra	20	X FAC	(1)
3. Pinus taeda	30	X FAC	Total Number of Dominant
			Species Across All Strata: 5 (B)
4. Acer rubrum	15	FAC	Descent of Deminent Charles
5. Liquidambar styraciflua	15	FAC+	Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)
6			That Aic OBE, FAOV, OF FAO.
			Prevalence Index worksheet:
7			Total % Cover of: Multiply by:
15 ft	90	= Total Cover	
Sapling Stratum (Plot size:15 ft)	00		OBL species x 1 =
1. Acer rubrum		X FAC	FACW species x 2 =
2,			FAC species x 3 =
3			FACU species x 4 =
			UPL species x 5 =
4,			
5			Column Totals: (A) (B)
6,0			Decision of the device DIA
7			Prevalence Index = B/A =
	20	= Total Cover	Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size;15 ft)		. 3.2. 30701	Rapid Test for Hydrophytic Vegetation
1 Not Applicable			Dominance Test is >50%
			Prevalence Index is ≤3.0 <sup>1</sup>
2			
3			Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
4			
5			Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6			
			<sup>1</sup> Indicators of hydric soil and wetland hydrology must
7			be present, unless disturbed or problematic.
		- T-(-1 O	
Less Courses (DL.C.) 5 ff	$\overline{}$	= Total Cover	Definitions of Vegetation Strata:
Herb Stratum (Plot size: 5 ft )			Definitions of Vegetation Strata:
Herb Stratum (Plot size: 5 ft )  1. Arundinaria gigantea	20	FACW	Tree – Woody plants, excluding woody vines,
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1. Arundinaria gigantea 2	20		Tree – Woody plants, excluding woody vines,
1. Arundinaria gigantea 2 3			Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
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1. Arundinaria gigantea 2		FACW	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
1. Arundinaria gigantea 2		Total Cover  X FAC  FACW  FACW  FACW  FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
1. Arundinaria gigantea 2		Total Cover  X FAC  FACW  FACW  FACW  FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
1. Arundinaria gigantea 2		Total Cover  X FAC  FACW  FACW  FACW  FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
1. Arundinaria gigantea 2		Total Cover  X FAC  FACW  FACW  FACW  FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation
1. Arundinaria gigantea 2		Total Cover  X FAC  FACW  FACW  FACW  FAC	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  Woody vine – All woody vines, regardless of height.  Hydrophytic Vegetation

Sampling Point: UP A6WD009

1	ription: (Describe t	o the depth				or confirm	the absence	of indicate	ors.)
Depth (inches)	Matrix Color (moist)		Redo Color (moist)	ox Feature %	es Type <sup>1</sup>	Loc²	Texture		Remarks
0 - 1	10 YR 3/3	100	zeie. (iiiolotj		.,,,,,		SL	-	SL = Sandy loam
1 - 5	2.5 Y 5/4	100		-			SL	7	
5 - 12+	10 YR 6/8	100		//			SCL	901	L = Sandy clay loam
3-12+	10 11 0/6	100		-			- SCL	301	L - Sandy Clay Idam
				-0			-	-	
				- )	*******				
									-
				_	-			-	
1Type: C=Cc	oncentration, D=Depl	otion PM-P	Induced Matrix C	S=Covere	d or Coate	d Sand Gra	ine <sup>2</sup> l o	oation: DI -	Pore Lining, M=Matrix.
Hydric Soil I		elion, Rivi-R	educed Matrix, C	3-Covere	u or Coate	d Sand Gra			roblematic Hydric Soils <sup>3</sup> :
Histosol			Dark Surface	e (S7)					A10) (MLRA 147)
	ipedon (A2)		Polyvalue B		ace (S8) <b>(</b> N	ILRA 147, 1			oodplain Soils (F19)
Black His			Thin Dark So			147, 148)	-	(MLRA 13	6, 147)
	n Sulfide (A4)		Loamy Gley		(F2)				Material (TF2)
	Layers (A5) ck (A10) (LRR N)		Depleted Ma		E6)				Dark Surface (TF12) in in Remarks)
	Below Dark Surface	(A11)	Depleted Da					zuiei (⊏xpia	in in Remarks)
	rk Surface (A12)	(,	Redox Depr						
1100000	ucky Mineral (S1) <b>(L</b>	RR N,	Iron-Mangar		ses (F12) (	LRR N,			
	147, 148)		MLRA 13				9.		
	leyed Matrix (S4)		Umbric Surfa						ydrophytic vegetation and
	edox (S5) Matrix (S6)		Piedmont Fl	ooupiain s	solis (F 19)	(WLKA 146	-		ology must be present, bed or problematic.
	ayer (if observed):							incoo diotal	bed of problematic.
Туре:									
Depth (inc	hes):		<del></del> -				Hydric Soil	Present?	Yes No X
Remarks:							_		
No obvious	hydric soil indicate	ors							
110 0511000	Try and don maidae	010.5							

WBZ

## WETLAND RATING WORKSHEET (4th VERSION)

A6WD

Project Name: Tri-Ex Nearest Road: US401/Old McCuller's Rd Wetland Area (ac): 0.6 Name of Evaluator(s): Tom Barrett; Mulkey Inc.	County: Wake  Date: 3/24/2010  Wetland Width (ft): 100
on sound or estusuary, pond or lake  on perennial steam on intermittent stream within interstream divide other	ADJACENT LAND USE:  (within 1/2 mile upstream, upslope or radius)  x forested/natural vegetation x agricultural/ urbanized impervious surface  Adjacent Special Natural Areas
Soil Series: Wehadkee and Bibb Soils  predominantly organic (humus, muck or peat)  x predominantly mineral (non-sandy) predominantly sandy  HYDRAULIC FACTORS:	DOMINANT VEGETATION:  1
x freshwater brackish steep topography ditched or channelized x total wetland width >= 100 feet  WETLAND TYPE: (select one)*	semipermanently to permenently flooded or inundated seasonally flooded or inundated intermittently flooded or temporary surface water no evidence of flooding or surface water
x Bottomland Hardwood Forest Bog Swamp Forest Hea Carolina Bay Bog Pocosin Eph	/Fen dwater Forest Forest emeral Wetland er: h marshes or stream channels.
DEM RATING	
WATER STORAGE 3	X 4 = <u>12</u>
BANK, SHORELINE STABILIZATION 2	X 4 = <u>8</u>
POLLUTANT REMOVAI 3 *	X 5 =15
WILDLIFE HABITAT 3	X 2 =6
AQUATIC LIFE HABITAT. 2	X 4 =8
RECREATION/EDUCATION 2  TOT	$X  1 = \underline{\qquad \qquad 2}$ $TAL \text{ WETLAND SCORE} = \underline{\qquad \qquad 51}$

<sup>\*</sup> Add one point if in sensitive watershed and >10% nonpoint disturbance within 1/2 mile upstream, upslope, or radius.

#### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont



Project/Site: Triangle Expressway (A8)	City/County: Wake Sampling Date: 6/9/2010
Applicant/Owner: N.C. Turnpike Authority	State: NC Sampling Point: A8WE10
Investigator(s): Wendee B. Smith, Mulkey, Inc.	Section, Township, Range: Williams Crossroads
Landform (hillslope, terrace, etc.): floodplain	Local relief (concave, convex, none): none
Slope (%): 0 - 2 Lat: 35.636018	Long:78.650345
Soil Map Unit Name: Rains fine sandy loam	NWI classification: PFO1A
Are climatic / hydrologic conditions on the site typical for this time of y	
Are Vegetation, Soil, or Hydrology significantl	y disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology naturally p	roblematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showin	g sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?  Remarks:  Yes X No Wesland Hydrology Present?  Yes X No Remarks:	Is the Sampled Area within a Wetland?  Yes X No
NCWAM - Bottomland Hardwood Forest	
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
Surface Water (A1)  High Water Table (A2)  True Aquatic f	
The region of the second of th	ospheres on Living Roots (C3) Moss Trim Lines (B16)
	leduced Iron (C4)
	eduction in Tilled Soils (C6)
Drift Deposits (B3)	
Algal Mat or Crust (B4)  Uron Deposits (B5)	[EZ]
Inundation Visible on Aerial Imagery (B7)	Geomorphic Position (D2) Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Microtopographic Relief (D4)
Aquatic Fauna (B13)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No Depth (inches	10
Water Table Present?  Yes X No Depth (inches	
Saturation Present? Yes X No Depth (inches (includes capillary fringe)	s):U Wetland Hydrology Present? Yes X No
Describe Recorded Data (stream gauge, monitoring well, aerial photo	ios, previous inspections), if available:
Remarks:	
Normano.	

20 %	Absolute Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 ft radius )	% Cover Species? Status	Number of Dominant Species
1. Pinus taeda	60 X FAC	That Are OBL, FACW, or FAC: 7 (A)
2. Liriodendron tulipifera	60 X FAC	Total Number of Dominant
3. Ilex opaca	15 FAC	Species Across All Strata: 7 (B)
4. Liquidambar styraciflua	15FAC	Percent of Dominant Species
5		That Are OBL, FACW, or FAC:100% (A/B)
6		Prevalence Index worksheet:
7,		Total % Cover of: Multiply by:
Sapling Stratum (Plot size:15 ft radius)	150 = Total Cover	OBL species x 1 =
Sapling Stratum (Plot size: 15 it radius )  1. Liquidambar styraciflua	25 X FAC	I .
2. Pinus taeda	10 X FAC	FAC species x 2 =
3. Juniperus virginiana	5 FAC	FAC species x 3 =
		FACU species x 4 =
4		UPL species x 5 =
5,		Column Totals: (A) (B)
6.	-,	Prevalence Index = B/A =
7.		Hydrophytic Vegetation Indicators:
Shrub Stratum (Plot size:15 ft radius)	40 = Total Cover	Rapid Test for Hydrophytic Vegetation
1. Vaccinium corymbosum	15 X FACW	Dominance Test is >50%
2. Arundinaria gigantea	10 X FACW	Prevalence Index is ≤3.0¹
3. Magnolia virginiana	5 FACW	Morphological Adaptations <sup>1</sup> (Provide supporting
	<del> </del>	data in Remarks or on a separate sheet)
4		Problematic Hydrophytic Vegetation¹ (Explain)
5		
6.		<sup>1</sup> Indicators of hydric soil and wetland hydrology must
7		be present, unless disturbed or problematical
Herb Stratum (Plot size: 5 ft radius )	30 = Total Cover	Definitions of Vegetation Strata:
1 Osmunda cinnamomea	10 X FACW	Tana Marada alamba assaludin assaludin a
2 Carex sp.	15	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in.
109		(7.6 cm) or larger in diameter at breast height (DBH).
3		Sapling – Woody plants, excluding woody vines,
4		approximately 20 ft (6 m) or more in height and less
5		than 3 in. (7.6 cm) DBH.
6		Shrub – Woody plants, excluding woody vines,
7		approximately 3 to 20 ft (1 to 6 m) in height.
8,		Herb – All herbaceous (non-woody) plants, including
9,		herbaceous vines, regardless of size. Includes woody
10.	· — — — — — — — — — — — — — — — — — — —	plants, except woody vines, less than approximately 3
116		ft (1 m) in height.
12		Woody vine – All woody vines, regardless of height.
30 ft radius	25 = Total Cover	
Woody Vine Stratum (Plot size: 30 ft radius )		
1,		
2,	·	
3,		Hydrophytic
4		Vegetation
5,		Present? Yes X No No
	= Total Cover	
Remarks: (Include photo numbers here or on a separate	sheet.)	

SOIL Sampling Point: A8WE103

epth	Matrix			x Features			_	
nches)	Color (moist)		Color (moist)	%	Type <sup>1</sup>	_Loc <sup>2</sup>	<u>Texture</u>	Remarks
0 - 10	10 YR 2/1	100						silty sandy organic
10 - 12	10 YR 2/1	80	10 YR 4/1	20	D	M	SLoam	
					-			7-
	*							- 12
					=======================================			
	- 2							-
				-				
ype: C=Con	centration, D=Deple	etion, RM=Red	uced Matrix, CS	=Covered	or Coated	d Sand Gra	ains. <sup>2</sup> Le	ocation: PL=Pore Lining, M=Matrix.
ydric Soil Inc	dicators:	Series Co.						cators for Problematic Hydric Soils
Histosol (A	<b>\1</b> )		Dark Surface	(S7)				2 cm Muck (A10) (MLRA 147)
Histic Epip			Polyvalue Bel		e (S8) <b>(M</b> I	LRA 147,		Piedmont Floodplain Soils (F19)
Black Histi	' '		Thin Dark Su					(MLRA 136, 147)
Hydrogen	Sulfide (A4)		Loamy Gleye					Red Parent Material (TF2)
Stratified L	ayers (A5)	<u>&gt;</u>	Depleted Mat	rix (F3)				Very Shallow Dark Surface (TF12)
	(A10) (LRR N)	1	Redox Dark S	Surface (F6	5)			Other (Explain in Remarks)
	Below Dark Surface	(A11)	Depleted Dari	k Surface	(F7)			
_	Surface (A12)	<u> </u>	Redox Depre					
	cky Mineral (S1) <b>(Ll</b>	RRN, L			s (F12) <b>(L</b>	.RR N,		
	<b>47, 148)</b>	-	MLRA 136	•			2	
	yed Matrix (S4)	<u></u>	Umbric Surfac					ndicators of hydrophytic vegetation an
Sandy Red		_	Piedmont Flo	odplain So	ils (F19) <b>(</b>	MLRA 14	-	wetland hydrology must be present,
Stripped M								unless disturbed or problematic.
	yer (if observed):							
Туре:								
Depth (inch	es):						Hydric So	il Present? Yes <u>X</u> No <u></u>
emarks:								
7.								

#### WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont



Project/Site: _Triangle Expressway (A8)	City/County: Wake	Sampling Date: _6/9/2010
Applicant/Owner: N.C. Turnpike Authority	Stat	te: NC Sampling Point: A8WEUP103
Investigator(s): Wendee B. Smith, Mulkey, Inc.	Section, Township, Range: Williams	Crossroads
Landform (hillslope, terrace, etc.): hillslope	Local relief (concave, convex	
Slope (%): 0 - 2 Lat: 35.636128	Long: -78.650343	Datum: NAD 83
Soil Map Unit Name: Rains fine sandy loam	· · · · · · · · · · · · · · · · · · ·	classification:
Are climatic / hydrologic conditions on the site typical for this time of y		plain in Remarks.)
		ances" present? Yes X No
		y answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing		
Hydrophytic Vegetation Present? Yes X No		
Hydrophytic Vegetation Present?  Hydric Soil Present?  Yes X No Yes No X	Is the Sampled Area	
Wetland Hydrology Present? Yes No X	within a Wetland? Yes	s No X
Remarks:	S	
HYDROLOGY		
Wetland Hydrology Indicators:	Seconda	ry Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surfa	ace Soil Cracks (B6)
Surface Water (A1)	_	sely Vegetated Concave Surface (B8)
	· · · · · · · · · · · · · · · · · · ·	nage Patterns (B10)
		s Trim Lines (B16) Season Water Table (C2)
		rfish Burrows (C8)
Drift Deposits (B3)		ration Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Other (Explain		ted or Stressed Plants (D1)
Iron Deposits (B5)	Geor	morphic Position (D2)
Inundation Visible on Aerial Imagery (B7)		low Aquitard (D3)
Water-Stained Leaves (B9)		otopographic Relief (D4)
Aquatic Fauna (B13)	Ŭ FAC	-Neutral Test (D5)
Field Observations:  Surface Water Present?  Yes No X Depth (inches	s);	
	b):	
	s): Wetland Hydrology	Present? Yes No X
(includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial phot	os, previous inspections), it available:	
Remarks:		<del></del>
		1
		1
		1
		[
		[

<b>VEGETATION</b> – Use scientific names of plants		Samplin	ng Point:A8	WEUP10		
20 #	Absolute	Dominant	Indicator	Dominance Test worksheet:		
Tree Stratum (Plot size: 30 ft radius )		Species?		Number of Dominant Species	6	
1. Pinus taeda	90	×	FAC	That Are OBL, FACW, or FAC:	6	(A)
2. Liriodendron tulipifera	15	<u> </u>	FAC	Total Number of Dominant	_	
3		<u> </u>		Species Across All Strata:	6	(B)
4		ļ		Percent of Dominant Species		
5				That Are OBL, FACW, or FAC:	100%	(A/B)
6				Daniela a a la descripción de la constante de		
7,				Prevalence Index worksheet:	A.A. (42 s.L. (5	
Sapling Stratum (Plot size: 15 ft radius	105	= Total Co	ver	Total % Cover of:		
Supring Sudden: (1 lot Size).	65		FAC	OBL species x 1		
1, Liquidambar styraciflua	5	<u>×</u>	FACU	FACW species x 2		
2. Oxydendron arboreum		<u> </u>	FACU	FAC species x 3		
3,				FACU species x 4		
4				UPL species x 5		
5			8	Column Totals: (A)		_ (B)
6				Prevalence Index = B/A = _		
7				Hydrophytic Vegetation Indicate		<del>-</del> -
as the same and th		= Total Co	ver	Rapid Test for Hydrophytic Ve		
Shrub Stratum (Plot size: 15 ft radius )	00		FACIA	Dominance Test is >50%	getation	
1. Persea palustris		LX-	FACW	12		
2. Liquidambar styraciflua	15	X	FAC	Prevalence Index is ≤3.0¹		
3. Arundinaria gigantea	10	$\sqsubseteq \times \sqsubseteq$	FACW	Morphological Adaptations <sup>1</sup> (F data in Remarks or on a se		
4	-\			Problematic Hydrophytic Vege		
5				Troblematic Hydrophytic vege	itation (Expla	'',
6				Indicators of hydric soil and wetlan	nd hydrology r	muet
7,,				be present, unless disturbed or pro		iiusi
Harb Stratum (Plot size: 5 ft radius	45	= Total Co	ver	Definitions of Vegetation Strata:		
Tierb Stratum (1 lot size.	2		FAC			
1. Smilax rotundifolia	2	×_	TAC	Tree – Woody plants, excluding we approximately 20 ft (6 m) or more it		l in
2				(7.6 cm) or larger in diameter at br		
3						·
4			ss	Sapling – Woody plants, excluding approximately 20 ft (6 m) or more i		
5				than 3 in. (7.6 cm) DBH.		
6				Shrub – Woody plants, excluding	woody vinos	
7				approximately 3 to 20 ft (1 to 6 m)		
8						
9				Herb – All herbaceous (non-wood) herbaceous vines, regardless of si		
10				plants, except woody vines, less th		
11.				ft (1 m) in height.		
12				Woody vine - All woody vines, reg	gardless of he	ight.
45.6	2	= Total Co	ver			- 100
Woody Vine Stratum (Plot size:15 ft radius)						
1						
2						
3				Hodge alachie		
4				Hydrophytic Vegetation		
5					No	
		= Total Co	ver			
Remarks: (Include photo numbers here or on a separate	sheet.)					

A8WEUP103

Sampling Point: A8WEUP103

SOIL

	cription: (Describe	to the depti				or confirm	the absenc	e of indicat	ors.)	
Depth (inches)	Matrix Color (moist)	<u>%</u>	Redo Color (moist)	x Feature %	Type <sup>1</sup>	_Loc²	_ Texture		Remarks	
0 - 4	10 YR 4/2	100	Color (moist)		TYPE	LUC	SLoam		Remarks	-
			0.51/.4/0					-		
4 - 12	10 YR 6/4	80	2.5Y 4/3	20	C	M_	SLoam			
								.00		
-	1/_			1.5				(): <del></del>		
								US		
	₹ <del></del>						}	896 <del></del>		<del></del> 3
1- 00							. 2,	·	- 100 m - 100 m 1 m 1	
Hydric Soil	oncentration, D=Depl	etion, RM=	Reduced Matrix, CS	S=Covere	d or Coate	d Sand Gr			Problematic Hyd	
Histosol			Dork Surface	(07)					_	
	oipedon (A2)		Dark Surface Polyvalue Be		oo (SR) (N	NI DA 147			(A10) <b>(MLRA 14</b> loodplain Soils (l	
Black Hi			Thin Dark Su				140)	(MLRA 1		119)
	n Sulfide (A4)		Loamy Gleye			, <b>. ,</b>			Material (TF2)	
Stratified	Layers (A5)		Depleted Ma		. ,				w Dark Surface	(TF12)
	ick (A10) (LRR N)		Redox Dark	Surface (F	F6)			Other (Expla	ain in Remarks)	
	d Below Dark Surface	e (A11)	Depleted Dai							
	ark Surface (A12)		Redox Depre							
	lucky Mineral (S1) (L	RR N,	Iron-Mangan		ses (F12) (	LRR N,				
	<b>147, 148)</b> Gleyed Matrix (S4)		MLRA 13 Umbric Surfa		/MI PA 13	6 122\	3 <sub>In</sub>	dicators of h	nydrophytic vege	station and
	ledox (S5)		Piedmont Flo						rology must be i	
	Matrix (S6)			го аргант о	, , , , , , , , , , , , , , , , , , ,	(			rbed or problem	
	ayer (if observed):								•	
Type:										
Depth (inc	ches):		_				Hydric So	il Present?	Yes	No 🔀
Remarks:	fa_									



## WETLAND RATING WORKSHEET (4th VERSION)

Nearest Road: Wetland Area (ac): Name of Evaluator(s):  Irrangle Expressway (A8) Holland Church Road 28acres Wendee B. Smith, Mulkey, I	Date: Wetland Width (ft):  Wetland Width (ft):  Wake 6/9/2010 350ft
on sound or estusuary, pond or lake on perennial steam on intermittent stream within interstream divide other	ADJACENT LAND USE:  (within 1/2 mile upstream, upslope or radius)  forested/natural vegetation agricultural/ urbanized impervious surface  Adjacent Special Natural Areas
Soil Series: Rains fine sandy loam  predominantly organic (humus, muck or pea predominantly mineral (non-sandy) predominantly sandy  HYDRAULIC FACTORS:	DOMINANT VEGETATION:  1 Liriodendron tulipifera 2 Liquidambar styraciflua 3 Arundinaria gigantea 4 Juncus effusus  FLOODING AND WETNESS:
freshwater brackish steep topography ditched or channelized total wetland width >= 100 feet  WETLAND TYPE: (select one)*	semipermanently to permenently flooded or inundated seasonally flooded or inundated intermittently flooded or temporary surface water no evidence of flooding or surface water
Swamp Forest Carolina Bay Pocosin Pine Savannah Freshwater Marsh	Bog/Fen Headwater Forest Bog Forest Ephemeral Wetland Other:
* The rating system cannot be applied to salt and brace <b>DEM RATING</b>	kish marshes or stream channels.
WATER STORAGE 4	X 4 = 16
BANK, SHORELINE STABILIZATION 1	X 4 =4
POLLUTANT REMOVAI 2 *	X 5 = <u>10</u>
WILDLIFE HABITAT	X 2 = 8
AQUATIC LIFE HABITAT	x 4 =16
RECREATION/EDUCATION 2	X 1 =2
	TOTAL WETLAND SCORE =56

<sup>\*</sup> Add one point if in sensitive watershed and >10% nonpoint disturbance within 1/2 mile upstream, upslope, or radius.

Project/Site: C540	City/County: W	Vake	Sampling Date:	8/14/17			
Applicant/Owner: NCDOT		State: NC	_Sampling Point:	WVX-WET			
Investigator(s): J. Tisdale, S. Easterly, J. Garvey	Section, Township	, Range:					
Landform (hillside, terrace, etc.): flat	Local relief (concave,	convex, none): concave	Slope (%):	<1			
Subregion (LRR or MLRA): LRR P, MLRA 136 L	 at: 35.687571	Long: 35.687571	 Datum:	NAD83			
Soil Map Unit Name: CtC - Creedmoor silt loam, 6 to		NWI classifica	tion: PEM				
Are climatic / hydrologic conditions on the site typical			explain in Remarks	s )			
Are Vegetation, Soil, or Hydrology		Normal Circumstances" present?	•	,			
Are Vegetation, Soil, or Hydrology	naturally problematic? (If nee	eded, explain any answers in Re	marks.)				
SUMMARY OF FINDINGS – Attach site n	nap showing sampling point	locations, transects, im	portant featur	res, etc.			
Hydric Soil Present? Yes	X No Is the Sampled A within a Wetland		No				
Remarks: Wetland with problematic soils.							
HYDROLOGY							
Wetland Hydrology Indicators:		Secondary Indicators	-	equired)			
Primary Indicators (minimum of one is required; che		Surface Soil Crac	` '	(5.0)			
<del></del>	ue Aquatic Plants (B14)		Sparsely Vegetated Concave Surface (B8)  X Drainage Patterns (B10)				
	rdrogen Sulfide Odor (C1)		X Drainage Patterns (B10)				
	kidized Rhizospheres on Living Roots	· ·	Moss Trim Lines (B16)				
<del></del>	esence of Reduced Iron (C4)		Dry-Season Water Table (C2)				
<del></del>	ecent Iron Reduction in Tilled Soils (Co in Muck Surface (C7)		on Aerial Imagery	, (C0)			
<del></del>	her (Explain in Remarks)	Stunted or Stress		/ (C9)			
Iron Deposits (B5)	Ter (Explain in Remarks)	X Geomorphic Posit	` ,				
Inundation Visible on Aerial Imagery (B7)		Shallow Aquitard					
Water-Stained Leaves (B9)		Microtopographic					
Aquatic Fauna (B13)		X FAC-Neutral Test					
Field Observations:							
	X Depth (inches): 0						
Surface Water Present? Yes No Water Table Present? Yes No	X Depth (inches): 0						
Saturation Present? Yes No		Vetland Hydrology Present?	Yes X	No			
(includes capillary fringe)							
Describe Recorded Data (stream gauge, monitoring	well, aerial photos, previous inspection	ons), if available:					
Remarks: Saturated top 1" due to rain. This area is catching w	ater from 540 fillslopes. Drains into S	SF.					

# **VEGETATION (Four Strata)** – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1.				Number of Dominant Species
2.				That Are OBL, FACW, or FAC: 4 (A)
3.				Total Number of Dominant
4.				Species Across All Strata: 4 (B)
5.				Percent of Dominant Species
6.				That Are OBL, FACW, or FAC: 100.0% (A/B)
7.				Prevalence Index worksheet:
		=Total Cover		Total % Cover of: Multiply by:
50% of total cover:	20%	of total cover:		OBL species 70 x 1 = 70
Sapling/Shrub Stratum (Plot size: 30' r )				FACW species 105 x 2 = 210
1. Salix nigra	20	Yes	OBL	FAC species 10 x 3 = 30
2. Baccharis halimifolia	20	Yes	FACW	FACU species 10 x 4 = 40
3		- <u></u>		UPL species 20 x 5 = 100
4				Column Totals: 215 (A) 450 (B)
5.				Prevalence Index = B/A = 2.09
6.				Hydrophytic Vegetation Indicators:
7.				1 - Rapid Test for Hydrophytic Vegetation
8.				X 2 - Dominance Test is >50%
9.				X 3 - Prevalence Index is ≤3.0 <sup>1</sup>
	40 :	=Total Cover		4 - Morphological Adaptations <sup>1</sup> (Provide supporting
50% of total cover: 20	20%	of total cover:	8	data in Remarks or on a separate sheet)
Herb Stratum (Plot size: 15' r )				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
1. Juncus effusus	60	Yes	FACW	<del>                                   </del>
2. Carex lurida	30	Yes	OBL	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
3. Typha latifolia	20	No	OBL	Definitions of Four Vegetation Strata:
4. Scirpus cyperinus	20	No	FACW	
5. Heterotheca subaxillaris	20	No	UPL	<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of
				height.
6. Rubus argutus	10	No No	FACU	
7. Platanus occidentalis	5	No No	FACW	Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft
8. Microstegium vimineum	5	No	FAC	(1 m) tall.
9. Liquidambar styraciflua	5	No	FAC	
10				<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
11				
<del>-</del>		=Total Cover		Woody Vine – All woody vines greater than 3.28 ft in
50% of total cover: 88	20%	of total cover:	35	height.
Woody Vine Stratum (Plot size:)				
1				
2		- <u></u>		
3				
4				
5.				Hydrophytic
_		=Total Cover		Vegetation
50% of total cover:	20%	of total cover:		Present? Yes X No
Remarks: (Include photo numbers here or on a separa	ate sheet \			
include prioto numbers here or on a separa	ite sneet.)			

Sampling Point: WVX-WET

SOIL Sampling Point: WVX-WET

Profile Desc	cription: (Describe t	o the dep	th needed to docu	ment th	ne indica	ator or c	onfirm the absence	of indicators.)
Depth	Matrix		Redox	(Featur	es			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-2	5yr 4/4	90	5yr 5/2	10	<u>C</u>	<u>M</u>	Loamy/Clayey	Distinct redox concentrations
2-14	2.5yr 4/2	80	10yr 7/8	20	<u>C</u>	<u>M</u>	Loamy/Clayey	Prominent redox concentrations
<sup>1</sup> Type: C=C	oncentration, D=Deple	etion, RM=	Reduced Matrix, N	IS=Masl	ked Sand	d Grains.	<sup>2</sup> Location	: PL=Pore Lining, M=Matrix.
Hydric Soil	Indicators:						Indic	cators for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Be	low Sur	face (S8)	(MLRA	147, 148)2	2 cm Muck (A10) (MLRA 147)
Histic Ep	oipedon (A2)		Thin Dark Su	ırface (S	9) <b>(MLR</b>	A 147, 1	48)(	Coast Prairie Redox (A16)
Black Hi	stic (A3)		Loamy Muck	y Minera	al (F1) <b>(N</b>	ILRA 13	6)	(MLRA 147, 148)
Hydroge	n Sulfide (A4)		Loamy Gleye	d Matrix	k (F2)		F	Piedmont Floodplain Soils (F19)
Stratified	d Layers (A5)		X Depleted Ma	trix (F3)				(MLRA 136, 147)
2 cm Mu	ıck (A10) (LRR N)		Redox Dark	Surface	(F6)		F	Red Parent Material (F21)
Depleted	d Below Dark Surface	(A11)	Depleted Dar	k Surfa	ce (F7)			(outside MLRA 127, 147, 148)
Thick Da	ark Surface (A12)		Redox Depre	ssions (	(F8)		\	/ery Shallow Dark Surface (F22)
Sandy M	lucky Mineral (S1)		Iron-Mangan	ese Mas	sses (F12	2) <b>(LRR I</b>	Ν,(	Other (Explain in Remarks)
Sandy C	Gleyed Matrix (S4)		MLRA 136	)				
Sandy R	ledox (S5)		Umbric Surfa	ice (F13	) (MLRA	122, 13	<b>3</b> Indio	cators of hydrophytic vegetation and
Stripped	Matrix (S6)		Piedmont Flo	odplain	Soils (F	19) <b>(MLR</b>	( <b>A 148)</b> v	wetland hydrology must be present,
Dark Su	rface (S7)		Red Parent N	/laterial	(F21) <b>(M</b>	LRA 127	, <b>147, 148)</b>	unless disturbed or problematic.
Restrictive	Layer (if observed):		_ <del></del>					
Type:	,							
Depth (ii	nches):						Hydric Soil Prese	ent? Yes X No
Soils, Versio	n 8.0, 2016.			_				the NRCS Field Indicators of Hydric

Project/Site: C540	City/County: Wake		Sampling Date: 8/14/17		
Applicant/Owner: NCDOT		State: NC	Sampling Point: WVX-UP		
Investigator(s): J. Tisdale, S. Easterly, J. Garvey	Section, Township, Range	e:			
Landform (hillside, terrace, etc.): flat	Local relief (concave, convex	κ, none): convex	Slope (%): 1		
Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 35.687		-78.84928	Datum: NAD83		
Soil Map Unit Name: CtC - Creedmoor silt loam, 6 to 10 perce		NWI classificat	tion: UPL		
Are climatic / hydrologic conditions on the site typical for this tin			explain in Remarks.)		
Are Vegetation, Soil, or Hydrology signific		Circumstances" present?			
Are Vegetation, Soil, or Hydrology natura		explain any answers in Re			
SUMMARY OF FINDINGS – Attach site map sho					
Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes No Wetland Hydrology Present? Yes No	Is the Sampled Area within a Wetland?	Yes	No X		
HYDROLOGY					
		Socondary Indicators	(minimum of two required)		
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required; check all that	apply)	Surface Soil Crack	(minimum of two required)		
•	Plants (B14)		ed Concave Surface (B8)		
<del></del>	ulfide Odor (C1)	Drainage Patterns (B10)			
Saturation (A3) Oxidized Rhi	zospheres on Living Roots (C3)	Moss Trim Lines (B16)			
Water Marks (B1)Presence of	Reduced Iron (C4)	Dry-Season Water Table (C2)			
Sediment Deposits (B2) Recent Iron I	Reduction in Tilled Soils (C6)	Crayfish Burrows			
Drift Deposits (B3) Thin Muck S			on Aerial Imagery (C9)		
<u> </u>	in in Remarks)	Stunted or Stresse			
Iron Deposits (B5)		Geomorphic Posit	, ,		
Inundation Visible on Aerial Imagery (B7)		Shallow Aquitard			
Water-Stained Leaves (B9) Aquatic Fauna (B13)		Microtopographic FAC-Neutral Test	, ,		
Field Observations:		IAC-Neutral rest	(D3)		
	oth (inches): 0				
	oth (inches): 0				
		d Hydrology Present?	Yes No _ X		
(includes capillary fringe)					
Describe Recorded Data (stream gauge, monitoring well, aeria	photos, previous inspections), if	available:			
Demodus					
Remarks:					

#### VEGETATION (Four Strata) – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: 30' r )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
Liriodendron tulipifera	30	Yes	FACU	
Carpinus caroliniana	30	Yes	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)
Quercus rubra	20	Yes	FACU	
4. Nyssa sylvatica	10	No	FAC	Total Number of Dominant Species Across All Strata: 13 (B)
5. Quercus alba	10	No	FACU	``
	10		TACO	Percent of Dominant Species
6.				That Are OBL, FACW, or FAC: 53.8% (A/B)  Prevalence Index worksheet:
7	100	=Total Cover		
500/ of total agreem 50			00	Total % Cover of: Multiply by:
50% of total cover: 50	20%	of total cover:	20	OBL species 0 x1 = 0
Sapling/Shrub Stratum (Plot size: 30' r )			=	FACW species 20 x 2 = 40
1. Pinus taeda	20	Yes	FAC	FAC species 120 x 3 = 360
2. <u>Ilex opaca</u>	10	Yes	FACU	FACU species100 x 4 =400
3. Acer rubrum	10	Yes	FAC	UPL species 0 x 5 = 0
4				Column Totals: 240 (A) 800 (B)
5				Prevalence Index = B/A = 3.33
6				Hydrophytic Vegetation Indicators:
7				1 - Rapid Test for Hydrophytic Vegetation
8.	_			X 2 - Dominance Test is >50%
9.				3 - Prevalence Index is ≤3.0 <sup>1</sup>
	40	=Total Cover		4 - Morphological Adaptations <sup>1</sup> (Provide supporting
50% of total cover: 20	20%	of total cover:	8	data in Remarks or on a separate sheet)
Herb Stratum (Plot size: 15' r )				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
1. Microstegium vimineum	30	Yes	FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
2. Osmundastrum cinnamomeum	20	Yes	FACW	present, unless disturbed or problematic.
Parthenocissus quinquefolia	10	Yes	FACU	Definitions of Four Vegetation Strata:
Hamamelis virginiana	10	Yes	FACU	- The state of the
5. Vitis rotundifolia	10	Yes	FAC	<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of
6. Acer rubrum	10	Yes	FAC	height.
7. Quercus alba	10	Yes	FACU	
	10	162	FACU	Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft
8				(1 m) tall.
9.				
10	_			<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
11				
		=Total Cover		Woody Vine – All woody vines greater than 3.28 ft in
50% of total cover: 50	20%	of total cover:	20	height.
Woody Vine Stratum (Plot size:)				
1				
2				
3				
4				
5				Hydronhydia
		=Total Cover		Hydrophytic Vegetation
50% of total cover:	20%	of total cover:		Present? Yes X No
Remarks: (Include photo numbers here or on a separ	ata shoot )			<u> </u>
Remarks. (include prioto numbers here or on a separ	ate Sheet.)			

Sampling Point:

WVX-UP

SOIL Sampling Point: WVX-UP

	ription: (Describe t	o the de	-			ator or co	onfirm the abs	sence of indic	cators.)		
Depth (inches)	Matrix	%		x Featu		Loc <sup>2</sup>	Taytura		Dom	o who	
(inches)	Color (moist)	100	Color (moist)	%_	Type <sup>1</sup>	LOC	Texture	<u> </u>	Kem	arks	
0-2	10yr 4/4						Loamy/Clay				
2-14	10yr 6/6	100					Loamy/Clay	/ey			
								<del></del>			
	ncentration, D=Depl	etion, RM	=Reduced Matrix, N	/IS=Mas	ked Sand	d Grains.	<sup>2</sup> Lc	ocation: PL=F			
Hydric Soil In			Dobavoluo B	alaw Cu	rface (CO	\ /MI DA	4.47 4.40)			tic Hydric Soils <sup>3</sup> :	
Histosol (			Polyvalue Be Thin Dark St			-	-		uck (A10) <b>(M</b> i	-	
Black His	pedon (A2)		Loamy Muck				-		rairie Redox <b>A 147, 148)</b>	(A16)	
	n Sulfide (A4)		Loamy Gley			ILKA 13	9)	-	nt Floodplain	Soile (F10)	
	Layers (A5)		Depleted Ma		, ,				A 136, 147)	30lis (F19)	
	ck (A10) <b>(LRR N)</b>		Redox Dark	• •				-	rent Material	(F21)	
	Below Dark Surface	(A11)	Depleted Da						ide MLRA 12	` '	
	rk Surface (A12)	(,,,,	Redox Depre					-	allow Dark S	-	
	ucky Mineral (S1)		Iron-Mangar			2) <b>(LRR I</b>	٧.		Explain in Rei		
	eyed Matrix (S4)		MLRA 136		`	, (	•		•	,	
Sandy Re			Umbric Surfa	ace (F1	3) <b>(MLRA</b>	122, 130	6)	<sup>3</sup> Indicators o	of hydrophytic	vegetation and	
Stripped I	Matrix (S6)		Piedmont Fl	oodplair	Soils (F	19) <b>(MLR</b>	A 148)	A 148) wetland hydrology must be present,			
Dark Surf	face (S7)		Red Parent I	Material	(F21) <b>(M</b>	LRA 127	, 147, 148)	unless o	disturbed or p	roblematic.	
Restrictive L	ayer (if observed):										
Type:											
Depth (in	ches):						Hydric Soil	Present?	Yes	No X	
Remarks:											
	et is revised from Ea	astern Mo	untains and Piedmo	ont Regi	onal Sup	plement '	Version 2.0 to i	nclude the NR	RCS Field Ind	icators of Hydric	
Soils, Version Soil very friab	•										
con very mas											

Project/Site: C540	City/County: Wake		_Sampling Date:	8/14/17		
Applicant/Owner: NCDOT		State: NC	Sampling Point:	WVZ-WET		
Investigator(s): J. Tisdale, J. Garvey	Section, Township, Ran	ge:				
Landform (hillside, terrace, etc.): hillslope	Local relief (concave, conve	ex, none): concave	Slope (%):	<1		
Subregion (LRR or MLRA): LRR P, MLRA 136 La	g: -78.845508	 Datum:	NAD83			
Soil Map Unit Name: CtC - Creedmoor silt loam, 6 to		NWI classifica	tion: PEM			
Are climatic / hydrologic conditions on the site typical			explain in Remark	s )		
Are Vegetation, Soil, or Hydrology		al Circumstances" present?	•	,		
Are Vegetation, Soil, or Hydrology	naturally problematic? (If needed,	explain any answers in Re	marks.)			
SUMMARY OF FINDINGS – Attach site m	ap showing sampling point loca	ations, transects, im	portant featu	res, etc.		
Hydrophytic Vegetation Present?  Hydric Soil Present?  Wetland Hydrology Present?  Yes X	No within a Wetland?	Yes X	No			
Remarks: Linear wetland, drainage pattern.						
HYDROLOGY						
Wetland Hydrology Indicators:		Secondary Indicators	(minimum of two	required)		
Primary Indicators (minimum of one is required; chec		Surface Soil Crac	` '			
<del></del>	e Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)				
	drogen Sulfide Odor (C1)	X Drainage Patterns (B10)				
	dized Rhizospheres on Living Roots (C3)	Moss Trim Lines (B16)				
	esence of Reduced Iron (C4)	Dry-Season Water Table (C2)				
<del></del>	cent Iron Reduction in Tilled Soils (C6)	Crayfish Burrows		(00)		
<del></del>	n Muck Surface (C7)	Saturation Visible		/ (C9)		
<del></del>	ner (Explain in Remarks)	Stunted or Stress	` '			
Iron Deposits (B5)		Geomorphic Posit	, ,			
Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9)		Shallow Aquitard Microtopographic				
Aquatic Fauna (B13)		X FAC-Neutral Test				
<del></del>	<del></del>	A I AC-Neuliai Test	(D3)			
Field Observations:	Danth (inch on)					
Surface Water Present? Yes X No Water Table Present? Yes X No	Depth (inches): 6					
Water Table Present? Yes X No	Depth (inches): 0	n d Ulydrala my Draa antO	Vaa V	NI.		
Saturation Present? Yes X No	Depth (inches): 0 Wetlar	nd Hydrology Present?	Yes X	NO		
(includes capillary fringe)  Describe Recorded Data (stream gauge, monitoring	well aerial photos, previous inspections), i	if available:				
Describe Necorded Data (Stream gauge, monitoring	well, actial priolos, previous inspections), i	available.				
Remarks:						

### VEGETATION (Four Strata) – Use scientific names of plants.

Tree Stratum (Plot size:	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1.				Number of Dominant Species
2.				That Are OBL, FACW, or FAC: 3 (A)
3.				Total Number of Dominant
4.				Species Across All Strata: 3 (B)
5.				Percent of Dominant Species
6.				That Are OBL, FACW, or FAC: 100.0% (A/B)
7.				Prevalence Index worksheet:
		Total Cover		Total % Cover of: Multiply by:
50% of total cover:	20%	of total cover:		OBL species 100 x 1 = 100
Sapling/Shrub Stratum (Plot size: )				FACW species 15 x 2 = 30
1. Salix nigra	20	Yes	OBL	FAC species 0 x 3 = 0
2. Baccharis halimifolia	5	Yes	FACW	FACU species 0 x 4 = 0
3.				UPL species 0 x 5 = 0
4.				Column Totals: 115 (A) 130 (B)
5.				Prevalence Index = B/A = 1.13
6.				Hydrophytic Vegetation Indicators:
7.				1 - Rapid Test for Hydrophytic Vegetation
8.				X 2 - Dominance Test is >50%
9.				X 3 - Prevalence Index is ≤3.0 <sup>1</sup>
·	25 =	Total Cover		4 - Morphological Adaptations <sup>1</sup> (Provide supporting
50% of total cover:		of total cover:	5	data in Remarks or on a separate sheet)
Herb Stratum (Plot size: )		o. 101a. 0010		Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
1. Typha latifolia	80	Yes	OBL	¹Indicators of hydric soil and wetland hydrology must be
2. Juncus effusus	10	No	FACW	present, unless disturbed or problematic.
3.				Definitions of Four Vegetation Strata:
4.				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
5.				more in diameter at breast height (DBH), regardless of
6.				height.
7.				Sapling/Shrub – Woody plants, excluding vines, less
8.				than 3 in. DBH and greater than or equal to 3.28 ft
9.				(1 m) tall.
10.				<b>Herb</b> – All herbaceous (non-woody) plants, regardless
11.				of size, and woody plants less than 3.28 ft tall.
	90 =	Total Cover		Woody Vine – All woody vines greater than 3.28 ft in
50% of total cover: 4		of total cover:	18	height.
Woody Vine Stratum (Plot size: )		or total oover.		
2.				
3.				
4				
5.				
J		Total Cover		Hydrophytic
FOR/ of total covery				Vegetation
50% of total cover:	,	of total cover:		Present?
Remarks: (Include photo numbers here or on a sepa	rate sheet.)			

Sampling Point:

WVZ-WET

SOIL Sampling Point: WVZ-WET

Profile Desc	cription: (Describe to	o the dept	h needed to docu	ment th	ne indica	tor or co	onfirm the abs	ence of indic	ators.)	
Depth	Matrix	•		Featur					·	
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Remark	s
0-2	7.5yr 3/4						Loamy/Clay	ey		
2-6	2.5y 3/1						Sandy			
6-14	10yr 6/6						Loamy/Clay	ey		
<sup>1</sup> Type: C=Ce	oncentration, D=Deple	etion, RM=l	Reduced Matrix, M	IS=Masl	ked Sand	Grains.	<sup>2</sup> Lo	cation: PL=P	ore Lining, M=N	latrix.
Hydric Soil			·						or Problematic	
Histosol	(A1)		Polyvalue Be	low Sur	face (S8)	(MLRA	147, 148)	2 cm Mu	uck (A10) <b>(MLR</b>	A 147)
Histic Ep	oipedon (A2)		Thin Dark Su	ırface (S	9) <b>(MLR</b>	A 147, 14	48)	Coast P	rairie Redox (A1	6)
Black Hi	stic (A3)		Loamy Muck	y Minera	al (F1) <b>(M</b>	ILRA 136	5)	(MLR	A 147, 148)	
Hydroge	n Sulfide (A4)		Loamy Gleye	ed Matrix	k (F2)			Piedmor	nt Floodplain So	ils (F19)
Stratified	d Layers (A5)		X Depleted Ma	trix (F3)				(MLR	A 136, 147)	
2 cm Mu	ıck (A10) (LRR N)		Redox Dark S	Surface	(F6)			Red Par	ent Material (F2	1)
Depleted	d Below Dark Surface	(A11)	Depleted Dar	rk Surfa	ce (F7)			(outsi	de MLRA 127, 1	47, 148)
Thick Da	ark Surface (A12)		Redox Depre	ssions (	(F8)				allow Dark Surfa	
	lucky Mineral (S1)		Iron-Mangan		sses (F12	2) <b>(LRR N</b>	١,	Other (E	xplain in Remar	ks)
	Gleyed Matrix (S4)		MLRA 136					2		
	Redox (S5)		Umbric Surfa				-		f hydrophytic ve	-
	Matrix (S6)		Piedmont Flo							
	rface (S7)		Red Parent N	/laterial	(F21) <b>(M</b>	LRA 127	, 147, 148)	unless d	listurbed or prob	lematic.
Restrictive I	Layer (if observed):									
Type:										
Depth (in	nches):						Hydric Soil	Present?	Yes X	No
Remarks: This data sh Soils, Versio	eet is revised from Ea in 8.0, 2016.	stern Mour	ntains and Piedmo	nt Regio	onal Supp	olement \	Version 2.0 to in	nclude the NR	CS Field Indicat	ors of Hydric

Project/Site: C540	City/County: Wake	Sampling Date: 8/14/	17		
Applicant/Owner: NCDOT		State: NC Sampling Point: WVZ	Z-UP		
Investigator(s): J. Tisdale, J. Garvey	Section, Township, Rar	ge:			
Landform (hillside, terrace, etc.): hillslope	Local relief (concave, conv	ex, none): concave Slope (%):			
Subregion (LRR or MLRA): LRR P, MLRA 13	6 Lat: 35.688612 Lon	g: -78.845417 Datum: NAD8	3		
Soil Map Unit Name: CtC - Creedmoor silt loa		NWI classification: UPL			
Are climatic / hydrologic conditions on the site	·				
Are Vegetation, Soil, or Hydrold		al Circumstances" present? Yes X No			
Are Vegetation, Soil, or Hydrold		explain any answers in Remarks.)			
<del></del>			. 4 -		
SUMMARY OF FINDINGS – Attach	site map snowing sampling point loc	ations, transects, important features, e	etc.		
Hydrophytic Vegetation Present?	es X No Is the Sampled Area				
	/es No X within a Wetland?	Yes No X			
Wetland Hydrology Present?	/es No X	<del></del>			
Remarks:	<u> </u>				
HYDROLOGY					
Wetland Hydrology Indicators:		Secondary Indicators (minimum of two require	ed)		
Primary Indicators (minimum of one is require	ed; check all that apply)	Surface Soil Cracks (B6)			
Surface Water (A1)	True Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8	<b>(</b> )		
High Water Table (A2)	Hydrogen Sulfide Odor (C1)	Drainage Patterns (B10)			
Saturation (A3)	Oxidized Rhizospheres on Living Roots (C3)		Moss Trim Lines (B16)		
Water Marks (B1)	Presence of Reduced Iron (C4)	Dry-Season Water Table (C2)			
Sediment Deposits (B2)	Recent Iron Reduction in Tilled Soils (C6)	Crayfish Burrows (C8)			
Drift Deposits (B3)	Thin Muck Surface (C7)	Saturation Visible on Aerial Imagery (C9)			
Algal Mat or Crust (B4)	Other (Explain in Remarks)	Stunted or Stressed Plants (D1)			
Iron Deposits (B5)		Geomorphic Position (D2)			
Inundation Visible on Aerial Imagery (B7)		Shallow Aquitard (D3)			
Water-Stained Leaves (B9)		Microtopographic Relief (D4)			
Aquatic Fauna (B13)		FAC-Neutral Test (D5)			
Field Observations:		<del></del>			
Surface Water Present? Yes	No X Depth (inches): 0				
Water Table Present? Yes					
Saturation Present? Yes		nd Hydrology Present? Yes No _	Х		
(includes capillary fringe)					
Describe Recorded Data (stream gauge, mon	itoring well, aerial photos, previous inspections),	f available:			
Remarks:					

**VEGETATION** (Four Strata) – Use scientific names of plants. Sampling Point: WVZ-UP Absolute Dominant Indicator <u>Tree Stratum</u> (Plot size: ) % Cover Species? Status **Dominance Test worksheet:** 1. Number of Dominant Species 2. That Are OBL, FACW, or FAC: (A) 3. Total Number of Dominant 4. Species Across All Strata: (B) 5. Percent of Dominant Species 6. That Are OBL, FACW, or FAC: 75.0% (A/B) Prevalence Index worksheet: =Total Cover Total % Cover of: 20% of total cover: 50% of total cover: **OBL** species x 1 = Sapling/Shrub Stratum (Plot size: 30' r **FACW** species x 2 = Baccharis halimifolia 40 1. FACW **FAC** species x3 =120 20 FAC 60 x 4 = 2. Pinus taeda Yes **FACU** species 240 3. UPL species 0 x 5 = 0 4. Column Totals: 140 (A) 440 (B) 5. Prevalence Index = B/A = 3 14 6. **Hydrophytic Vegetation Indicators:** 7. 1 - Rapid Test for Hydrophytic Vegetation 8. X 2 - Dominance Test is >50% 9. 3 - Prevalence Index is ≤3.01 4 - Morphological Adaptations<sup>1</sup> (Provide supporting 60 =Total Cover data in Remarks or on a separate sheet) 50% of total cover: 30 20% of total cover: Herb Stratum (Plot size: 15' r ) Problematic Hydrophytic Vegetation<sup>1</sup> (Explain) 1. Lespedeza cuneata 60 Yes **FACU** <sup>1</sup>Indicators of hydric soil and wetland hydrology must be 2. Pinus taeda Yes FAC present, unless disturbed or problematic. 3. **Definitions of Four Vegetation Strata:** 4. Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of 5. height. 6. 7. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft 8. (1 m) tall. 9. Herb - All herbaceous (non-woody) plants, regardless 10. of size, and woody plants less than 3.28 ft tall. =Total Cover Woody Vine - All woody vines greater than 3.28 ft in 50% of total cover: 40 20% of total cover: Woody Vine Stratum (Plot size: ) 1. 2. 3. 4. **Hydrophytic** =Total Cover Vegetation 50% of total cover: 20% of total cover: Present? Yes X No Remarks: (Include photo numbers here or on a separate sheet.)

**SOIL** Sampling Point: WVZ-UP

	ription: (Describe t	o the dep				tor or co	onfirm the abso	ence of indi	cators.)	
Depth	Matrix			x Featur		. 2	<b>-</b> .			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Rem	narks
0-14	10yr 5/6	100								
			_							_
¹Type: C=Co	oncentration, D=Deple	etion. RM:	=Reduced Matrix. N	 //S=Mas	ked Sand	Grains	<sup>2</sup> l o	cation: PI =F	Pore Lining, N	/I=Matrix
Hydric Soil I		o	. roddodd main, r							atic Hydric Soils <sup>3</sup> :
Histosol			Polyvalue Be	elow Sur	rface (S8	(MLRA	147, 148)		uck (A10) <b>(M</b>	-
	ipedon (A2)		Thin Dark S		` '	•			Prairie Redox	•
Black His			Loamy Muck	•			•		A 147, 148)	,
	n Sulfide (A4)		Loamy Gley	-			•	-	nt Floodplain	Soils (F19)
	Layers (A5)		Depleted Ma						A 136, 147)	, ,
2 cm Mu	ck (A10) (LRR N)		Redox Dark	Surface	(F6)			Red Pa	rent Material	(F21)
Depleted	Below Dark Surface	(A11)	Depleted Da	rk Surfa	ice (F7)			(outs	ide MLRA 12	27, 147, 148)
Thick Da	rk Surface (A12)		Redox Depre	essions	(F8)			Very Sh	nallow Dark S	urface (F22)
Sandy M	ucky Mineral (S1)		Iron-Mangar	ese Ma	sses (F12	2) (LRR N	l,	Other (I	Explain in Rei	marks)
Sandy G	leyed Matrix (S4)		MLRA 136	•						
	edox (S5)		Umbric Surfa							vegetation and
	Matrix (S6)		Piedmont Fl				-			ust be present,
	face (S7)		Red Parent	Material	(F21) <b>(M</b>	LRA 127,	147, 148)	unless	disturbed or p	roblematic.
	.ayer (if observed):									
Type:										
Depth (in	ches):						Hydric Soil	Present?	Yes	No X
Remarks:										
Soils, Version	eet is revised from Ea	astern Mo	intains and Piedmo	ont Regi	onal Sup	olement V	ersion 2.0 to in	iclude the Ni	RCS Field Inc	licators of Hydric
Jolis, Version	10.0, 2010.									

Project/Site: C540	City/County: Wake	<b>;</b>	Sampling Date: 8/	/14/17		
Applicant/Owner: NCDOT		State: NC	Sampling Point: W	VWB-WET		
Investigator(s): J. Tisdale, J. Garvey	Section, Township, Rai	nge:				
Landform (hillside, terrace, etc.): hillslope	Local relief (concave, conv	vex, none): concave	Slope (%):	1		
Subregion (LRR or MLRA): LRR P, MLRA 136	Lat: 35.687681 Lor	ng: -78.845927	Datum: N	IAD83		
Soil Map Unit Name: CrE - Creedmoor sandy	oam, 10 to 20 percent slopes	NWI classificat	tion: PEM			
Are climatic / hydrologic conditions on the site t	· ·		explain in Remarks.)	)		
Are Vegetation, Soil, or Hydrolog		nal Circumstances" present?	•	,		
Are Vegetation, Soil, or Hydrolog	yynaturally problematic? (If needed	l, explain any answers in Re	marks.)			
SUMMARY OF FINDINGS – Attach s	ite map showing sampling point loc	ations, transects, im	portant feature	s, etc.		
Hydric Soil Present? Y	es X No Is the Sampled Area es X No within a Wetland?	Yes X	No			
Remarks: Cattail wetland above eph drainage pipe, problem.	ematic soils					
HYDROLOGY						
Wetland Hydrology Indicators:		Secondary Indicators	•	<u>quired)</u>		
Primary Indicators (minimum of one is required		X Surface Soil Cracl		(5.0)		
Surface Water (A1)	True Aquatic Plants (B14)		ed Concave Surface	; (B8)		
High Water Table (A2)	Hydrogen Sulfide Odor (C1)		X Drainage Patterns (B10)			
Saturation (A3)	<ul> <li>Oxidized Rhizospheres on Living Roots (C3)</li> <li>Presence of Reduced Iron (C4)</li> </ul>					
Water Marks (B1) Sediment Deposits (B2)	Recent Iron Reduction in Tilled Soils (C6)	Dry-Season Wate				
Drift Deposits (B3)	Thin Muck Surface (C7)		Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9)			
Algal Mat or Crust (B4)	Other (Explain in Remarks)	Stunted or Stresse		(03)		
Iron Deposits (B5)	Curor (Explain in recinatio)	Geomorphic Posit	` '			
Inundation Visible on Aerial Imagery (B7)		Shallow Aquitard (	` '			
Water-Stained Leaves (B9)		Microtopographic				
Aquatic Fauna (B13)		X FAC-Neutral Test				
Field Observations:			<u>`                                    </u>			
	No X Depth (inches): 0					
Water Table Present? Yes I	No X Depth (inches): 0					
Surface Water Present? Yes I Water Table Present? Yes I Saturation Present? Yes I I	No X Depth (inches): 0 Wetla	and Hydrology Present?	Yes X N	No		
(includes capillary fringe)						
Describe Recorded Data (stream gauge, moni	oring well, aerial photos, previous inspections),	if available:				
Remarks:						
	way pipe. Does not appear to be a stormwater f	feature				
2 Jamago pattorno coming in, comicoto to road	nay piper 2000 not appear to 50 a otonimator.					

#### **VEGETATION (Four Strata)** – Use scientific names of plants.

Tree Stratum (Plot size: 30' r )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
	10	Yes	OBL	
1. Salix nigra 2.		168	OBL	Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
3.				
<del></del>				Total Number of Dominant
4.				Species Across All Strata: 5 (B)
5 6.				Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)
7.				That Are OBL, FACW, or FAC: 80.0% (A/B)  Prevalence Index worksheet:
·	10 :	=Total Cover		Total % Cover of: Multiply by:
50% of total cover: 5		of total cover:	2	OBL species 90 x 1 = 90
Sapling/Shrub Stratum (Plot size: 30' r )		or total cover.		FACW species 30 x 2 = 60
1. Pinus taeda	5	Yes	FAC	FAC species 10 x 3 = 30
2. Quercus alba	5	Yes	FACU	FACU species 5 x 4 = 20
Baccharis halimifolia	5	Yes	FACW	UPL species 0 x 5 = 0
4.		100	171011	Column Totals: 135 (A) 200 (B)
5.				Prevalence Index = B/A = 1.48
6.				Hydrophytic Vegetation Indicators:
7.				1 - Rapid Test for Hydrophytic Vegetation
8.				X 2 - Dominance Test is >50%
9.				X 3 - Prevalence Index is ≤3.0¹
·	15 :	=Total Cover		4 - Morphological Adaptations <sup>1</sup> (Provide supporting
50% of total cover: 8		of total cover:	3	data in Remarks or on a separate sheet)
Herb Stratum (Plot size: 15' r )	2070	or total cover.		Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
1. Typha latifolia	80	Yes	OBL	
Persicaria maculosa	15	No	FACW	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
3. Juncus effusus	10	No	FACW	Definitions of Four Vegetation Strata:
4. Acer rubrum	5	No	FAC	
5.				<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of
6.				height.
7.				Sapling/Shrub – Woody plants, excluding vines, less
8.				than 3 in. DBH and greater than or equal to 3.28 ft
9.				(1 m) tall.
10.				Herb – All herbaceous (non-woody) plants, regardless
11.				of size, and woody plants less than 3.28 ft tall.
	110 :	=Total Cover		Woody Vine – All woody vines greater than 3.28 ft in
50% of total cover: 55		of total cover:	22	height.
Woody Vine Stratum (Plot size: )				
1.				
2.				
3				
4.				
5.				
•		=Total Cover		Hydrophytic
50% of total cover:		of total cover:		Vegetation Present? Yes X No
	•			100 <u>X</u> 100 <u>X</u>
Remarks: (Include photo numbers here or on a sepa	rate sneet.)			

Sampling Point:

WWB-WET

SOIL Sampling Point: WWB-WET

Profile Desc	ription: (Describe	to the dep	oth needed to doc	ument t	he indica	ator or c	onfirm the absence	of indicators.)
Depth	Matrix		Redo	x Featur	es			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-2	7.5yr 3/2	100					Loamy/Clayey	
2-10	5yr 4/3	80	10yr 5/1	20	D	М	Loamy/Clayey	
10-14	2.5yr 6/4	80	2.5y 5/1	20	D	M	Loamy/Clayey	
		·						
			_					
<sup>1</sup> Type: C=Co	ncentration, D=Depl	etion. RM	=Reduced Matrix. N	MS=Mas	ked Sand	Grains.	<sup>2</sup> Locatio	n: PL=Pore Lining, M=Matrix.
Hydric Soil I								icators for Problematic Hydric Soils <sup>3</sup> :
Histosol			Polyvalue B	elow Sur	face (S8)	(MLRA		2 cm Muck (A10) (MLRA 147)
	ipedon (A2)		Thin Dark S			-		Coast Prairie Redox (A16)
Black His			Loamy Mucl					(MLRA 147, 148)
Hydroger	n Sulfide (A4)		Loamy Gley	ed Matri	x (F2)		•	Piedmont Floodplain Soils (F19)
Stratified	Layers (A5)		Depleted Ma	atrix (F3)				(MLRA 136, 147)
2 cm Mu	ck (A10) (LRR N)		Redox Dark	Surface	(F6)			Red Parent Material (F21)
Depleted	Below Dark Surface	e (A11)	Depleted Da	ark Surfa	ce (F7)			(outside MLRA 127, 147, 148)
Thick Da	rk Surface (A12)		Redox Depr	essions	(F8)			Very Shallow Dark Surface (F22)
Sandy M	ucky Mineral (S1)		Iron-Mangar	nese Ma	sses (F12	2) <b>(LRR I</b>	Ν, Χ	Other (Explain in Remarks)
Sandy G	leyed Matrix (S4)		MLRA 13	6)				
Sandy Re	edox (S5)		Umbric Surf	ace (F13	3) <b>(MLRA</b>	122, 13	<b>3</b> Ind	icators of hydrophytic vegetation and
Stripped	Matrix (S6)		Piedmont FI	oodplain	Soils (F	19) <b>(ML</b> R	A 148)	wetland hydrology must be present,
Dark Sur	face (S7)		Red Parent	Material	(F21) <b>(M</b>	LRA 127	, 147, 148)	unless disturbed or problematic.
Restrictive L	.ayer (if observed):							
Type:								
Depth (in	ches):						Hydric Soil Pres	ent? Yes X No
Soils, Version								e the NRCS Field Indicators of Hydric

Project/Site: C540	City/County: Wake		Sampling Date: 8/14/17	
Applicant/Owner: NCDOT		State: NC	Sampling Point: WWB-UPL	
Investigator(s): J. Tisdale, J. Garvey	Section, Township, Range	e:		
Landform (hillside, terrace, etc.): hillslope	Local relief (concave, convex	, none): convex	Slope (%): <1	
Subregion (LRR or MLRA): LRR P, MLRA 13	6 Lat: 35.687686 Long:	-78.845976	Datum: NAD83	
Soil Map Unit Name: CrE - Creedmoor sandy		NWI classifica	tion: UPL	
Are climatic / hydrologic conditions on the site			explain in Remarks.)	
Are Vegetation, Soil, or Hydrol		Circumstances" present?		
Are Vegetation, Soil, or Hydrol		xplain any answers in Re		
SUMMARY OF FINDINGS – Attach	site map showing sampling point locat	ions, transects, im	portant features, etc.	
Hydrophytic Vegetation Present?	Yes X No Is the Sampled Area			
	Yes No X within a Wetland?	Yes	No X	
Wetland Hydrology Present?	/es No X		<del></del>	
Remarks:	•			
HYDROLOGY				
Wetland Hydrology Indicators:		Secondary Indicators	(minimum of two required)	
Primary Indicators (minimum of one is require	* * * * * * * * * * * * * * * * * * * *	Surface Soil Crac	, ,	
Surface Water (A1)	True Aquatic Plants (B14)		ed Concave Surface (B8)	
High Water Table (A2)	Hydrogen Sulfide Odor (C1)	Drainage Patterns		
Saturation (A3)	Oxidized Rhizospheres on Living Roots (C3)	Moss Trim Lines (B16)		
Water Marks (B1)	Presence of Reduced Iron (C4)	Dry-Season Wate		
Sediment Deposits (B2)	Recent Iron Reduction in Tilled Soils (C6)	Crayfish Burrows		
Drift Deposits (B3)	Thin Muck Surface (C7)		on Aerial Imagery (C9)	
Algal Mat or Crust (B4) Iron Deposits (B5)	Other (Explain in Remarks)	Stunted or Stress		
Inundation Visible on Aerial Imagery (B7		Geomorphic Posit		
Water-Stained Leaves (B9)		Microtopographic	` '	
Aquatic Fauna (B13)		FAC-Neutral Test		
Field Observations:			(23)	
Surface Water Present? Yes	No X Depth (inches): 0			
Water Table Present? Yes				
Saturation Present? Yes		Hydrology Present?	Yes No X	
(includes capillary fringe)	<u> </u>			
Describe Recorded Data (stream gauge, mor	itoring well, aerial photos, previous inspections), if a	available:		
Remarks:				

#### **VEGETATION (Four Strata)** – Use scientific names of plants.

Trac Stratum (Diet aire) 20	Absolute	Dominant	Indicator	Deminance Test weeksheets
Tree Stratum (Plot size: 30 )	% Cover	Species?	Status	Dominance Test worksheet:
1. Pinus taeda	20	Yes	FAC	Number of Dominant Species
2				That Are OBL, FACW, or FAC: 2 (A)
3.				Total Number of Dominant
4				Species Across All Strata: 3 (B)
5				Percent of Dominant Species
6.				That Are OBL, FACW, or FAC: 66.7% (A/B)
7		T-1-1 0		Prevalence Index worksheet:
500/ of total account 40		=Total Cover	4	Total % Cover of: Multiply by:
50% of total cover: 10	20%	of total cover:	4	OBL species 0 x1 = 0
Sapling/Shrub Stratum (Plot size: 30 )	00	V	E40)4/	FACW species 30 x 2 = 60
1. Baccharis halimifolia	20	Yes	FACW	FAC species 20 x 3 = 60
2.				FACU species 5 x 4 = 20
3				UPL species 80 x 5 = 400
4				Column Totals: 135 (A) 540 (B)
5				Prevalence Index = B/A = 4.00
6				Hydrophytic Vegetation Indicators:
7				1 - Rapid Test for Hydrophytic Vegetation
8				X 2 - Dominance Test is >50%
9				3 - Prevalence Index is ≤3.0 <sup>1</sup>
		=Total Cover		4 - Morphological Adaptations (Provide supporting
50% of total cover: 10	20%	of total cover:	4	data in Remarks or on a separate sheet)
Herb Stratum (Plot size:15)				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
Festuca trachyphylla	80	Yes	UPL	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
2. Persicaria maculosa	10	No	FACW	present, unless disturbed or problematic.
3. Lonicera japonica	5	No	FACU	Definitions of Four Vegetation Strata:
4				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
5				more in diameter at breast height (DBH), regardless of
6				height.
7				Sapling/Shrub – Woody plants, excluding vines, less
8				than 3 in. DBH and greater than or equal to 3.28 ft
9				(1 m) tall.
10				Herb – All herbaceous (non-woody) plants, regardless
11				of size, and woody plants less than 3.28 ft tall.
	95 =	=Total Cover		Woody Vine – All woody vines greater than 3.28 ft in
50% of total cover: 48	20%	of total cover:	19	height.
Woody Vine Stratum (Plot size:)				
1				
2.				
3				
4				
5				Hydrophytic
	=	=Total Cover		Vegetation
50% of total cover:	200/	of total cover:		Present? Yes X No
	20%			
Remarks: (Include photo numbers here or on a separ	_			
Remarks: (Include photo numbers here or on a separ	_			
Remarks: (Include photo numbers here or on a separ	_			
Remarks: (Include photo numbers here or on a separ	_			
Remarks: (Include photo numbers here or on a separ	_		<u> </u>	
Remarks: (Include photo numbers here or on a separ	_		·	

Sampling Point:

WWB-UPL

SOIL Sampling Point: WWB-UPL

Profile Desc	ription: (Describe t	o the dep	th needed to doc	ument t	he indica	tor or co	onfirm the abs	ence of indic	ators.)	
Depth	Matrix		Redo	x Featu	res					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Rem	arks
0-8	2.5yr 4/4	100					Loamy/Clay	/ey		
8-14	7.5yr 5/6	100					Loamy/Clay	ev.		
										_
										-
	oncentration, D=Depl	etion, RM=	Reduced Matrix, N	/IS=Mas	ked Sand	Grains.	<sup>2</sup> Lc	cation: PL=P		
Hydric Soil I										tic Hydric Soils <sup>3</sup> :
Histosol	` '		Polyvalue Be		, ,	•			ick (A10) <b>(ML</b>	-
	ipedon (A2)		Thin Dark S				-		airie Redox (	(A16)
Black His	n Sulfide (A4)		Loamy Muck	-		ILKA 130	))	-	<b>147, 148)</b> at Floodplain	Soils (E10)
	Layers (A5)		Depleted Ma						136, 147)	30lis (1-19)
	ck (A10) <b>(LRR N)</b>		Redox Dark					-	ent Material (	F21)
	Below Dark Surface	(A11)	Depleted Da		` '				de MLRA 12	
	rk Surface (A12)		Redox Depre					-	allow Dark Su	-
Sandy M	ucky Mineral (S1)		Iron-Mangar	ese Ma	sses (F12	2) <b>(LRR N</b>	١,	Other (E	xplain in Ren	narks)
	leyed Matrix (S4)		MLRA 136	,						
	edox (S5)				te (F13) <b>(MLRA 122, 136)</b> <sup>3</sup> Indicators of hydrophytic vegetation					
	Matrix (S6)		Piedmont Fl				-			ust be present,
	face (S7)		Red Parent	Material	(F21) <b>(M</b>	LRA 127	, 147, 148)	unless d	isturbed or p	roblematic.
	ayer (if observed):									
Type:	abaa).						Usalvia Cail	Dracent?	Vaa	No. V
Depth (in	iches).						Hydric Soil	Present?	Yes	NoX
Remarks:	eet is revised from Ea	actorn Mou	intoing and Diadma	not Dogi	anal Cun	olomont \	largian 2.0 to i	naluda tha ND	CC Eiold Indi	inators of Hudria
Soils, Version		astern wot	intains and Fleding	nii Negi	oriai Sup	Jiement v	/ ersion 2.0 to i	nciude the Mix	CS Field IIIdi	cators of Flydric
•	•									

Project/Site: C540	City/County: Wake	Sampling Date: 8/15/1	7	
Applicant/Owner: NCDOT		State: NC Sampling Point: WWC-	WET	
Investigator(s): J. Tisdale, J. Garvey	Section, Township, Range:			
Landform (hillside, terrace, etc.): hillslope	Local relief (concave, convex, n	one): slope Slope (%): 15	5	
Subregion (LRR or MLRA): LRR P, MLRA 13	6 Lat: 35.689055 Long: -7	3.841916 Datum: NAD83	 3	
Soil Map Unit Name: CrE - Creedmoor sandy	<del></del>	NWI classification: PEM		
Are climatic / hydrologic conditions on the site	· ·	No (If no, explain in Remarks.)		
Are Vegetation X, Soil X, or Hydrolo	· · · · · · · · · · · · · · · · · · ·	cumstances" present? Yes X No		
Are Vegetation, Soil, or Hydrold	ngynaturally problematic? (If needed, expl	ain any answers in Remarks.)		
SUMMARY OF FINDINGS – Attach	site map showing sampling point locatio	ns, transects, important features, e	tc.	
Hydric Soil Present?	Yes         X         No         Is the Sampled Area           Yes         X         No         within a Wetland?	Yes <u>X</u> No		
Remarks: Hillslope wetland/seep - inside on-ramp				
HYDROLOGY				
Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required	<u>(t</u>	
Primary Indicators (minimum of one is require	• • • • • • • • • • • • • • • • • • • •	X Surface Soil Cracks (B6)		
Surface Water (A1)	True Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)	1	
X High Water Table (A2)	Hydrogen Sulfide Odor (C1)	Drainage Patterns (B10)		
X Saturation (A3) Water Marks (B1)	Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)	Moss Trim Lines (B16)		
Sediment Deposits (B2)	Recent Iron Reduction in Tilled Soils (C6)	Dry-Season Water Table (C2) Crayfish Burrows (C8)		
Drift Deposits (B3)	Thin Muck Surface (C7)	Saturation Visible on Aerial Imagery (C9)		
Algal Mat or Crust (B4)	Other (Explain in Remarks)	Stunted or Stressed Plants (D1)		
Iron Deposits (B5)		Geomorphic Position (D2)		
Inundation Visible on Aerial Imagery (B7)	•	Shallow Aquitard (D3)		
Water-Stained Leaves (B9)	•	Microtopographic Relief (D4)		
Aquatic Fauna (B13)		X FAC-Neutral Test (D5)		
Field Observations:				
Surface Water Present? Yes	No X Depth (inches): 0			
Water Table Present? Yes X	No Depth (inches): 5			
Saturation Present? Yes X	No         X         Depth (inches):         0           No         Depth (inches):         5           No         Depth (inches):         6    Wetland H	ydrology Present? Yes X No		
(includes capillary fringe)				
Describe Recorded Data (stream gauge, mon	itoring well, aerial photos, previous inspections), if ava	ilable:		
Remarks: Appears to be perched but also could be Tria:	ssic basin hydrology			

#### **VEGETATION (Four Strata)** – Use scientific names of plants.

Tree Stratum (Plot size: )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1.				Number of Dominant Species
2.				That Are OBL, FACW, or FAC: 1 (A)
3.				Total Number of Dominant
4.				Species Across All Strata: 2 (B)
5.				Percent of Dominant Species
6.				That Are OBL, FACW, or FAC:50.0% (A/B)
7.				Prevalence Index worksheet:
	=	Total Cover		Total % Cover of: Multiply by:
50% of total cover:	20%	of total cover:		OBL species60 x 1 =60
Sapling/Shrub Stratum (Plot size:)				FACW species 10 x 2 = 20
1				FAC species 0 x 3 = 0
2.				FACU species 0 x 4 = 0
3				UPL species 40 x 5 = 200
4.				Column Totals: 110 (A) 280 (B)
5.				Prevalence Index = B/A = 2.55
6.				Hydrophytic Vegetation Indicators:
7.				1 - Rapid Test for Hydrophytic Vegetation
8.				2 - Dominance Test is >50%
9.				X 3 - Prevalence Index is ≤3.0 <sup>1</sup>
		Total Cover		4 - Morphological Adaptations <sup>1</sup> (Provide supporting
50% of total cover:	20%	of total cover:		data in Remarks or on a separate sheet)
Herb Stratum (Plot size: 15' )				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
1. Typha latifolia	60	Yes	OBL	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
2. Festuca trachyphylla	40	Yes	UPL	present, unless disturbed or problematic.
3. Baccharis halimifolia	10	No	FACW	Definitions of Four Vegetation Strata:
<ul><li>3. Baccharis halimifolia</li><li>4.</li></ul>	10	No	FACW	Definitions of Four Vegetation Strata:  Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
	10	No	FACW	<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of
4.	10	No No	FACW	<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
4.         5.	10	No	FACW	<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of
4. 5. 6.	10	No	FACW	<ul> <li>Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</li> <li>Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft</li> </ul>
4. 5. 6. 7.	10	No	FACW	<ul> <li>Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</li> <li>Sapling/Shrub – Woody plants, excluding vines, less</li> </ul>
4. 5. 6. 7. 8.	10	No	FACW	<ul> <li>Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</li> <li>Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</li> <li>Herb – All herbaceous (non-woody) plants, regardless</li> </ul>
4. 5. 6. 7. 8. 9.	10	No	FACW	<ul> <li>Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</li> <li>Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</li> </ul>
4. 5. 6. 7. 8. 9. 10.		No No	FACW	<ul> <li>Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</li> <li>Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</li> <li>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</li> <li>Woody Vine – All woody vines greater than 3.28 ft in</li> </ul>
4. 5. 6. 7. 8. 9. 10.				<ul> <li>Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</li> <li>Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</li> <li>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</li> </ul>
4.		=Total Cover		<ul> <li>Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</li> <li>Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</li> <li>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</li> <li>Woody Vine – All woody vines greater than 3.28 ft in</li> </ul>
4		=Total Cover		<ul> <li>Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</li> <li>Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</li> <li>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</li> <li>Woody Vine – All woody vines greater than 3.28 ft in</li> </ul>
4.		=Total Cover		<ul> <li>Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</li> <li>Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</li> <li>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</li> <li>Woody Vine – All woody vines greater than 3.28 ft in</li> </ul>
4.		=Total Cover		<ul> <li>Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</li> <li>Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</li> <li>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</li> <li>Woody Vine – All woody vines greater than 3.28 ft in</li> </ul>
4		=Total Cover		<ul> <li>Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</li> <li>Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</li> <li>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</li> <li>Woody Vine – All woody vines greater than 3.28 ft in</li> </ul>
4.		=Total Cover		<ul> <li>Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</li> <li>Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</li> <li>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</li> <li>Woody Vine – All woody vines greater than 3.28 ft in height.</li> </ul>
4.	110 = 5	=Total Cover		Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.
4.		=Total Cover of total cover:		<ul> <li>Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</li> <li>Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</li> <li>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</li> <li>Woody Vine – All woody vines greater than 3.28 ft in height.</li> </ul>
4		=Total Cover		Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic Vegetation
4.		=Total Cover		Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic Vegetation
4		=Total Cover		Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.
4		=Total Cover		Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.
4		=Total Cover		Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic Vegetation
4.		=Total Cover		Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.

Sampling Point: WWC-WET

SOIL Sampling Point: WWC-WET

Profile Desc	ription: (Describe t	o the dep	th needed to docu	ument th	ne indica	tor or co	onfirm the absence	of indicators.)
Depth	Matrix			x Featur	es			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-8	2.5yr 4/1	90	2.5yr 4/3	10	<u> </u>	M	Loamy/Clayey	Distinct redox concentrations
8-14	2.5y 6/6	60	2.5y 6/2	40	<u>C</u>	<u>M</u>	Loamy/Clayey	Two color matrix
¹Type: C=Cc	oncentration, D=Deple	etion RM	-Reduced Matrix			Grains	<sup>2</sup> Location	n: PL=Pore Lining, M=Matrix.
Hydric Soil I		etion, ixivi-	-iteaucea Matrix, iv	io-iviasi	Keu Sanc	Oranis.		cators for Problematic Hydric Soils <sup>3</sup> :
Histosol Histic Ep Black His Hydroger Stratified 2 cm Mu Depleted Thick Da Sandy M Sandy G Sandy R Stripped	(A1) ipedon (A2) stic (A3) n Sulfide (A4) Layers (A5) ck (A10) (LRR N) Below Dark Surface rk Surface (A12) ucky Mineral (S1) leyed Matrix (S4) edox (S5) Matrix (S6)	(A11)	Polyvalue Be Thin Dark Su Loamy Muck Loamy Gleye X Depleted Ma Redox Dark Depleted Da Redox Depre Iron-Mangan MLRA 136 Piedmont Fle	urface (S cy Minera ed Matrix itrix (F3) Surface rk Surface essions ( esse Mass b) ace (F13 podplain	(F6) (F6) (C) (S) (S) (S) (S) (MLRA (S) (MLRA	A 147, 1. ILRA 136 2) (LRR N 122, 136	147, 148)2 48)6 5)F	2 cm Muck (A10) (MLRA 147) Coast Prairie Redox (A16) (MLRA 147, 148) Piedmont Floodplain Soils (F19) (MLRA 136, 147) Red Parent Material (F21) (outside MLRA 127, 147, 148) Very Shallow Dark Surface (F22) Other (Explain in Remarks) cators of hydrophytic vegetation and wetland hydrology must be present,
Dark Sur	face (S7)		Red Parent I	Material	(F21) <b>(M</b>	LRA 127	, <b>147</b> , <b>148)</b> ι	unless disturbed or problematic.
Restrictive L	ayer (if observed):							
Type:								
Depth (in	iches):						Hydric Soil Prese	ent? Yes <u>X</u> No
Remarks:								

Project/Site: C540	City/County: Wake	Sampling Date: 8/15/1	7		
Applicant/Owner: NCDOT		State: NC Sampling Point: WWC	- -UPL		
Investigator(s): J. Tisdale, J. Garvey	Section, Township, Range	e:			
Landform (hillside, terrace, etc.): hillslope	Local relief (concave, convex	s, none): slope Slope (%):15	5		
Subregion (LRR or MLRA): LRR P, MLRA 1	36 Lat: 35.689071 Long:	-78.841821 Datum: NAD8	3		
Soil Map Unit Name: CrE-Creedmoor sandy	loam, 10 to 20 percent slopes	NWI classification: UPL			
Are climatic / hydrologic conditions on the site	·	No (If no, explain in Remarks.)			
Are Vegetation, Soil, or Hydro		Circumstances" present? Yes X No			
Are Vegetation, Soil, or Hydro		xplain any answers in Remarks.)	—		
	site map showing sampling point locat		tc.		
Hydrophytic Vegetation Present?	Yes No X Is the Sampled Area				
Hydric Soil Present?	Yes No X within a Wetland?	Yes No _X_	ļ		
Wetland Hydrology Present?	Yes NoX				
Remarks:					
HYDROLOGY					
Wetland Hydrology Indicators:		Secondary Indicators (minimum of two require	<u>d)</u>		
Primary Indicators (minimum of one is require		Surface Soil Cracks (B6)			
Surface Water (A1) High Water Table (A2)	True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1)	Sparsely Vegetated Concave Surface (B8)  Drainage Patterns (B10)	1		
Saturation (A3)	Oxidized Rhizospheres on Living Roots (C3)	Moss Trim Lines (B16)			
Water Marks (B1)	Presence of Reduced Iron (C4)	Dry-Season Water Table (C2)			
Sediment Deposits (B2)	Recent Iron Reduction in Tilled Soils (C6)	Crayfish Burrows (C8)			
Drift Deposits (B3)	Thin Muck Surface (C7)	Saturation Visible on Aerial Imagery (C9)			
Algal Mat or Crust (B4)	Other (Explain in Remarks)	Stunted or Stressed Plants (D1)			
Iron Deposits (B5)		Geomorphic Position (D2)			
Inundation Visible on Aerial Imagery (B7	<b>'</b> )	Shallow Aquitard (D3)			
Water-Stained Leaves (B9)		Microtopographic Relief (D4)			
Aquatic Fauna (B13)		FAC-Neutral Test (D5)			
Field Observations:					
Surface Water Present? Yes	No X Depth (inches): 0				
	No X Depth (inches): 0				
Saturation Present? Yes	No X Depth (inches): 0 Wetland	I Hydrology Present? Yes No	X		
(includes capillary fringe)					
Describe Recorded Data (stream gauge, mo	nitoring well, aerial photos, previous inspections), if	available:			
Remarks:					
Nomano.					

Troc Stretum (Diet size)	Absolute	Dominant	Indicator	Daminanas Tast waykahaati
<u>Tree Stratum</u> (Plot size:)	% Cover	Species?	Status	Dominance Test worksheet:
1				Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
3.				
4.				Total Number of Dominant Species Across All Strata: 3 (B)
5.				
6.				Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)
7.				Prevalence Index worksheet:
		=Total Cover		Total % Cover of: Multiply by:
50% of total cover:		of total cover:		OBL species 0 x 1 = 0
Sapling/Shrub Stratum (Plot size:				FACW species 20 x 2 = 40
1.				FAC species 0 x 3 = 0
2.				FACU species 20 x 4 = 80
3.				UPL species 50 x 5 = 250
4.				Column Totals: 90 (A) 370 (B)
5.				Prevalence Index = B/A = 4.11
6.				Hydrophytic Vegetation Indicators:
7.				1 - Rapid Test for Hydrophytic Vegetation
8.				2 - Dominance Test is >50%
9.				3 - Prevalence Index is ≤3.0 <sup>1</sup>
		=Total Cover		4 - Morphological Adaptations <sup>1</sup> (Provide supporting
50% of total cover:	20%	of total cover:		data in Remarks or on a separate sheet)
Herb Stratum (Plot size:)				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
Festuca trachyphylla	50	Yes	UPL	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
2. Baccharis halimifolia	20	Yes	FACW	present, unless disturbed or problematic.
3. Lespedeza cuneata	20	Yes	FACU	Definitions of Four Vegetation Strata:
4				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
5				more in diameter at breast height (DBH), regardless of
6.				height.
7				Sapling/Shrub – Woody plants, excluding vines, less
8				than 3 in. DBH and greater than or equal to 3.28 ft
9				(1 m) tall.
10 11.				<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
	90	=Total Cover		Woody Vine – All woody vines greater than 3.28 ft in
	15 20%	of total cover:	18	height.
Woody Vine Stratum (Plot size:)				
1				
2				
3				
4				
5				Hydrophytic
		=Total Cover		Vegetation
50% of total cover:	20%	of total cover:		Present?
Remarks: (Include photo numbers here or on a sepa	arate sheet.)			

Sampling Point: WWC-UPL

SOIL Sampling Point: WWC-UPL

Profile Desc	ription: (Describe t	o the dep	th needed to docu	ıment t	he indica	tor or c	onfirm the abs	ence of indi	cators.)	
Depth	Matrix		Redo	k Featur	es					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Rem	arks
0-4	2.5yr 4/6	100					Loamy/Clay	ey		
4-14	2.5y 5/6	60	2.5y 7/6	40			Loamy/Clay	ey	Two cold	or matrix
			<del></del>					<u> </u>		_
1- 0.0							21			
	oncentration, D=Deple	etion, RM:	=Reduced Matrix, N	1S=Mas	ked Sand	Grains.	-Lo		ore Lining, N	
Hydric Soil I			Dobarduo Br	Jaw Cu	face (CO)	/MI DA	4.47 4.40\			tic Hydric Soils <sup>3</sup> :
Histosol	ipedon (A2)		Polyvalue Be Thin Dark Su		, ,	•			uck (A10) <b>(MI</b> Prairie Redox	-
Black His			Loamy Muck				-		A 147, 148)	(A10)
	n Sulfide (A4)		Loamy Gleye			ILIX IS	·,	-	nt Floodplain	Soils (F19)
	Layers (A5)		Depleted Ma		, ,				A 136, 147)	00110 (1 10)
	ck (A10) <b>(LRR N)</b>		Redox Dark					-	rent Material	(F21)
	Below Dark Surface	(A11)	Depleted Da		` '				ide MLRA 12	
	rk Surface (A12)	, ,	Redox Depre					-	nallow Dark S	-
Sandy M	ucky Mineral (S1)		Iron-Mangan	ese Ma	sses (F12	2) <b>(LRR I</b>	١,	Other (I	Explain in Rer	narks)
Sandy G	leyed Matrix (S4)		MLRA 136	<b>5)</b>						
Sandy R	edox (S5)		Umbric Surfa				-	<sup>3</sup> Indicators of	of hydrophytic	vegetation and
	Matrix (S6)		Piedmont Flo				-	wetland	l hydrology m	ust be present,
	face (S7)		Red Parent I	Material	(F21) <b>(M</b>	LRA 127	, 147, 148)	unless	disturbed or p	roblematic.
	.ayer (if observed):									
Type:										
Depth (in	iches):						Hydric Soil	Present?	Yes	No _X
Remarks:										
This data she Soils, Version	eet is revised from Ea	astern Moi	untains and Piedmo	nt Regi	onal Sup <sub>l</sub>	olement '	Version 2.0 to it	nclude the Ni	RCS Field Ind	icators of Hydric
Julis, Version	16.0, 2016.									

## WETLAND DETERMINATION DATA SHEET - Atlantic and Gulf Coastal Plain Region

Project/Site: C540	City/County: Wak	че	Sampling Date: 8/15/17		
Applicant/Owner: NCDOT		State: NC	Sampling Point: WWD-WET		
Investigator(s): J. Tisdale, J. Garvey	Section, Township, Ra	ange:			
Landform (hillside, terrace, etc.): hillslope	Local relief (concave, con	nvex, none): concave	Slope (%):1		
Subregion (LRR or MLRA): LRR P, MLRA 13	33A Lat: 35.640021Lc	ong: -78.654744	Datum: NAD83		
Soil Map Unit Name: LyA - Lynchburg sandy		NWI classifica	ntion: PEM		
Are climatic / hydrologic conditions on the site	e typical for this time of year? Yes	X No (If no, e	explain in Remarks.)		
Are Vegetation, Soil, or Hydrold	ogy significantly disturbed? Are "Nor	mal Circumstances" present	? Yes X No		
Are Vegetation, Soil, or Hydrold		ed, explain any answers in Re	emarks.)		
	site map showing sampling point lo	ocations, transects, in	nportant features, etc.		
Hydrophytic Vegetation Present?	Yes X No Is the Sampled A	Area			
, , , ,	Yes X No within a Wetland		No		
	Yes X No				
Remarks: Pasture meadow wetland					
HYDROLOGY					
Wetland Hydrology Indicators:		Secondary Indicators	(minimum of two required)		
Primary Indicators (minimum of one is require	ed; check all that apply)	Surface Soil Crac			
Surface Water (A1)	Aquatic Fauna (B13)	Sparsely Vegetate	ed Concave Surface (B8)		
High Water Table (A2)	Marl Deposits (B15) (LRR U)	Drainage Patterns	s (B10)		
X Saturation (A3)	Hydrogen Sulfide Odor (C1)		Moss Trim Lines (B16)		
Water Marks (B1)	Oxidized Rhizospheres on Living Roots (C3	· -			
Sediment Deposits (B2)	Presence of Reduced Iron (C4)		Crayfish Burrows (C8)		
Drift Deposits (B3)	Recent Iron Reduction in Tilled Soils (C6)		Saturation Visible on Aerial Imagery (C9)		
Algal Mat or Crust (B4)	Thin Muck Surface (C7)	Geomorphic Position (D2)			
Iron Deposits (B5)	Other (Explain in Remarks)	Shallow Aquitard (D3)			
Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9)	)	X FAC-Neutral Test (D5) Sphagnum Moss (D8) (LRR T,U)			
		Spriagrium wioss	(D8) (LKK 1,U)		
Field Observations: Surface Water Present? Yes	No X Depth (inches): 0				
Water Table Present? Yes					
		land Hydrology Present?	Yes X No		
(includes capillary fringe)		autu ilyai elegy i i ee i	·••		
	nitoring well, aerial photos, previous inspections	s), if available:	-		
Remarks:					

<u>Tree Stratum</u> (Plot size: )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1.				
2.				Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
3.				
4.				Total Number of Dominant Species Across All Strata: 3 (B)
5.				
·				Percent of Dominant Species
6.				That Are OBL, FACW, or FAC: 100.0% (A/B)
7.				Prevalence Index worksheet:
8				Total % Cover of: Multiply by:
		=Total Cover		OBL species70 x 1 =70
50% of total cover:		of total cover:		FACW species 30 x 2 = 60
Sapling/Shrub Stratum (Plot size:)				FAC species 0 x 3 = 0
1				FACU species 0 x 4 = 0
2				UPL species 0 x 5 = 0
3.				Column Totals: 100 (A) 130 (B)
4.				Prevalence Index = B/A = 1.30
5.				Hydrophytic Vegetation Indicators:
6.				1 - Rapid Test for Hydrophytic Vegetation
7.				X 2 - Dominance Test is >50%
8.				X 3 - Prevalence Index is ≤3.0 <sup>1</sup>
		=Total Cover		Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover:		of total cover:		resistance riyarepriyare regenation (Explain)
Herb Stratum (Plot size: )		or total cover.		
	30	Voo	EACW.	
1. Echinochloa crus-galli		Yes	FACW	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
2. Juncus effusus	30	Yes	OBL	present, unless disturbed or problematic.
3. Scirpus cyperinus	30	Yes	OBL	Definitions of Four Vegetation Strata:
4. Persicaria punctata	10	No	OBL	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
5.				more in diameter at breast height (DBH), regardless of height.
6.				Height.
7.				Sapling/Shrub – Woody plants, excluding vines, less
8.				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
9.				, ,
10				Harle All back as a second (a second b) along to an anadian
11.				<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
12.				or size, and woody plante less than 6.25 it tail.
	100 :	=Total Cover		Woody Vine – All woody vines greater than 3.28 ft in
50% of total cover: 5	0 20%	of total cover:	20	height.
Woody Vine Stratum (Plot size: )				
3.				
4				
5				Hydrophytic
		=Total Cover		Vegetation
50% of total cover:	20%	of total cover:		Present?
Remarks: (If observed, list morphological adaptation	ns below.)			

Sampling Point: WWD-WET

SOIL Sampling Point: WWD-WET

	-	o the dep				ator or co	onfirm the absence	of indicators.)	
Depth (in the sa)	Matrix	- 0/		x Featur		1 2	Taurtuma	Demonto	
(inches)	Color (moist)	%	Color (moist)	<u>%</u>	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks	
0-14	10yr 4/1	80	10yr 7/1	20	D	M	Loamy/Clayey		
			-						
<sup>1</sup> Type: C=Co	ncentration, D=Deple	etion, RM=	Reduced Matrix, N	1S=Mas	ked San	d Grains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.	
	ndicators: (Applicat							for Problematic Hydric Soils <sup>3</sup> :	
Histosol (	A1)		Thin Dark Su	urface (S	9) <b>(LRR</b>	S, T, U)	1 cm N	Muck (A9) <b>(LRR O)</b>	
Histic Epi	pedon (A2)		Barrier Island	ds 1 cm	Muck (S	12)	2 cm N	Muck (A10) (LRR S)	
Black His	tic (A3)		(MLRA 15	3B, 153	D)		Coast	Prairie Redox (A16)	
Hydrogen	Sulfide (A4)		Loamy Muck	y Miner	al (F1) <b>(L</b>	.RR O)	(outs	side MLRA 150A)	
Stratified	Layers (A5)		Loamy Gleye	ed Matri	x (F2)		Reduce	ed Vertic (F18)	
	Bodies (A6) (LRR, P,		X Depleted Ma	trix (F3)	1		· · · · · · · · · · · · · · · · · · ·	side MLRA 150A, 150B)	
	cky Mineral (A7) (LR		Redox Dark					ont Floodplain Soils (F19) (LRR P, T)	
	sence (A8) (LRR U)		Depleted Da		` '			alous Bright Floodplain Soils (F20)	
	ck (A9) (LRR P, T)	(0.4.4)	Redox Depre		(F8)		•	RA 153B)	
	Below Dark Surface k Surface (A12)	(A11)	Marl (F10) (L	-	1) /MI D	\ 1E1\	Red Parent Material (F21)  Very Shallow Dark Surface (F22)		
	airie Redox (A16) ( <b>M</b>	I D A 150A	Depleted Oc  Iron-Mangan			-	<u> </u>	side MLRA 138, 152A in FL, 154)	
	ucky Mineral (S1) <b>(Li</b>		Umbric Surfa					Islands Low Chroma Matrix (TS7)	
	eyed Matrix (S4)	0, 0,	Delta Ochric			-		RA 153B, 153D)	
Sandy Re			Reduced Ve			-		(Explain in Remarks)	
	Matrix (S6)		Piedmont Flo					,	
Dark Surf	ace (S7) (LRR P, S,	T, U)	Anomalous I				*		
Polyvalue	Below Surface (S8)		(MLRA 14	9A, 153	C, 153D)	)	<sup>3</sup> Indica	tors of hydrophytic vegetation and	
(LRR S	s, T, U)		Very Shallov	Dark S	Surface (F	<sup>-</sup> 22)	wetl	and hydrology must be present,	
			(MLRA 13	8, 152A	in FL, 1	54)	unle	ss disturbed or problematic.	
Restrictive L	ayer (if observed):								
Type:									
Depth (in	ches):						Hydric Soil Prese	ent? Yes X No	
Remarks:	<u> </u>								
		lantic and	Gulf Coastal Plain	Regiona	al Supple	ment Vei	rsion 2.0 to include th	ne NRCS Field Indicators of Hydric	
Soils, Version	8.0, 2016.								

## WETLAND DETERMINATION DATA SHEET - Atlantic and Gulf Coastal Plain Region

Project/Site: C540	City/County: Wake	Sampling Date: 8/15/17			
Applicant/Owner: NCDOT		State: NC Sampling Point: WWD-UP			
Investigator(s): J. Tisdale, J. Garvey	Section, Township, Range	e:			
Landform (hillside, terrace, etc.): hillslope	Local relief (concave, convex	x, none): convex Slope (%): 1			
Subregion (LRR or MLRA): LRR P, MLRA 13	33A Lat: 35.639961 Long:	:-78.654796 Datum: NAD83			
Soil Map Unit Name: NoB - Norfolk loamy sar		NWI classification: UPL			
Are climatic / hydrologic conditions on the site	·	No (If no, explain in Remarks.)			
Are Vegetation, Soil, or Hydrok		Circumstances" present? Yes X No			
Are Vegetation , Soil , or Hydrold	<del></del>	explain any answers in Remarks.)			
<del></del>		tions, transects, important features, etc.			
Hydric Soil Present?	Yes         No         X         Is the Sampled Area           Yes         X         No         within a Wetland?	Yes No <u>X</u>			
HYDROLOGY					
Wetland Hydrology Indicators:	and shook all that apply)	Secondary Indicators (minimum of two required)			
Primary Indicators (minimum of one is require Surface Water (A1)	ed; cneck all that apply)  Aquatic Fauna (B13)	Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)			
High Water Table (A2)	Drainage Patterns (B10)				
Saturation (A3)					
Water Marks (B1)	Oxidized Rhizospheres on Living Roots (C3)	Moss Trim Lines (B16) Dry-Season Water Table (C2)			
Sediment Deposits (B2)	Presence of Reduced Iron (C4)	Crayfish Burrows (C8)			
Drift Deposits (B3)	Recent Iron Reduction in Tilled Soils (C6)	Saturation Visible on Aerial Imagery (C9)			
Algal Mat or Crust (B4)	Thin Muck Surface (C7)	Geomorphic Position (D2)			
Iron Deposits (B5)	Other (Explain in Remarks)	Shallow Aquitard (D3)			
Inundation Visible on Aerial Imagery (B7)	)	FAC-Neutral Test (D5)			
Water-Stained Leaves (B9)		Sphagnum Moss (D8) (LRR T,U)			
Field Observations:	No. V. Barth (backers).				
	No X Depth (inches): 0  No X Depth (inches): 0				
		d Hydrology Present? Yes No X			
(includes capillary fringe)	Wettain	u nydrology Fresent: 1es No			
	nitoring well, aerial photos, previous inspections), if	available:			
( 3 3 7					
Remarks:					

	Absolute	Dominant	Indicator	
Tree Stratum (Plot size:30' r)	% Cover	Species?	Status	Dominance Test worksheet:
Liquidambar styraciflua			FAC	Number of Dominant Species
2. Prunus serotina			FACU	That Are OBL, FACW, or FAC:1 (A)
3. Acer rubrum			FAC	Total Number of Dominant
4.				Species Across All Strata: 4 (B)
5.				Percent of Dominant Species
6.				That Are OBL, FACW, or FAC: 25.0% (A/B)
7.				Prevalence Index worksheet:
8.				Total % Cover of: Multiply by:
		=Total Cover		OBL species 5 x 1 = 5
50% of total cover:		of total cover		FACW species 60 x 2 = 120
Sapling/Shrub Stratum (Plot size:		, 0. 1010.		FAC species 0 x 3 = 0
1.	,			FACU species 55 x 4 = 220
				· — —
3.				Column Totals: 120 (A) 345 (B)
4				Prevalence Index = B/A = 2.88
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
8				3 - Prevalence Index is ≤3.0 <sup>1</sup>
		=Total Cover		Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover:	20%	of total cover		
Herb Stratum (Plot size: 15' r )				
Echinochloa crus-galli	60	Yes	FACW	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
2. Amaranthus spinosus	30	Yes	FACU	present, unless disturbed or problematic.
3. Juncus effusus	5	No	OBL	Definitions of Four Vegetation Strata:
4.				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
5.				
· · · · · · · · · · · · · · · · · · ·				more in diameter at breast height (DBH), regardless of height.
6.				more in diameter at breast height (DBH), regardless of
6. 7.				more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less
6. 7. 8.				more in diameter at breast height (DBH), regardless of height.
6				more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less
6. 7. 8. 9. 10.				more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless
6. 7. 8. 9. 11.				more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
6. 7. 8. 9. 10.				more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
6.		=Total Cover		more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
6.		=Total Cover		more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
6.				more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
6.				more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
6.	18 20%	of total cover		more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
6.	20	of total cover:	FACU	more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
6.	20	of total cover:	FACU	more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
6.	20	of total cover:	FACU	more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.
6.	20	of total cover:	FACU	more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.
6. 7. 8. 9. 10. 11. 12.  50% of total cover:	20 5	Yes Yes Yes Total Cover	FACU FACU	more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic Vegetation
6.	20 5 25 25	Yes Yes	FACU FACU	more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.
6. 7. 8. 9. 10. 11. 12.  50% of total cover:	20 5 25 25	Yes Yes Yes Total Cover	FACU FACU	more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic Vegetation
6.	20 5 25 25	Yes Yes Yes Total Cover	FACU FACU	more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic Vegetation
6.	20 5 25 25	Yes Yes Yes Total Cover	FACU FACU	more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic Vegetation
6.	20 5 25 25	Yes Yes Yes Total Cover	FACU FACU	more in diameter at breast height (DBH), regardless of height.  Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic Vegetation

Sampling Point: WWD-UP

SOIL Sampling Point: WWD-UP

	ription: (Describe t	o the dep				ator or co	onfirm the absence	of indicators.)	
Depth	Matrix			Featur					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks	
0-14	10yr 5/1	90	10yr 6/6	10	С	М	Loamy/Clayey	Prominent redox concentrations	
			_						
<sup>1</sup> Type: C=Co	ncentration, D=Deple	etion PM-	Peduced Matrix M	S-Mac	kad San	d Grains	<sup>2</sup> l ocation:	PL=Pore Lining, M=Matrix.	
	ndicators: (Applicat					u Giailis.		for Problematic Hydric Soils <sup>3</sup> :	
Histosol (		oic to an E	Thin Dark Su		-	S.T.U)		Muck (A9) (LRR O)	
	pedon (A2)		Barrier Island			-		Muck (A10) <b>(LRR S)</b>	
Black His			(MLRA 15			,		Prairie Redox (A16)	
	Sulfide (A4)		Loamy Muck		-	RR O)		side MLRA 150A)	
	Layers (A5)		Loamy Gleye			,	Reduc	ed Vertic (F18)	
Organic I	Bodies (A6) (LRR, P,	T, U)	X Depleted Ma	rix (F3)			(out	side MLRA 150A, 150B)	
5 cm Mud	cky Mineral (A7) (LR	R P, T, U)	Redox Dark S	Surface	(F6)		Piedm	ont Floodplain Soils (F19) (LRR P, T)	
Muck Pre	sence (A8) (LRR U)		Depleted Dar	k Surfa	ce (F7)		Anom	alous Bright Floodplain Soils (F20)	
1 cm Mud	ck (A9) <b>(LRR P, T)</b>		Redox Depre	ssions	(F8)		(ML	RA 153B)	
	Below Dark Surface	(A11)	Marl (F10) <b>(L</b>	-			Red Parent Material (F21)		
	rk Surface (A12)		Depleted Och			-	Very Shallow Dark Surface (F22)		
	airie Redox (A16) (M		· <del></del>					side MLRA 138, 152A in FL, 154)	
	ucky Mineral (S1) (LI	RR O, S)	Umbric Surfa			-		r Islands Low Chroma Matrix (TS7)	
	eyed Matrix (S4)		Delta Ochric			-	•	RA 153B, 153D)	
	edox (S5)		Reduced Ver					(Explain in Remarks)	
	Matrix (S6) face (S7) <b>(LRR P, S,</b>	T 11\	Piedmont Flo				-		
	Below Surface (S8)	-	(MLRA 149	-				ators of hydrophytic vegetation and	
(LRR S			Very Shallow					land hydrology must be present,	
(2	, ., .,		(MLRA 138		•	,		ess disturbed or problematic.	
Restrictive I	ayer (if observed):								
Type:	ayer (ii observea).								
Depth (in	choc):						Hydric Soil Pres	ent? Yes X No	
							Hydric 30ii Fres	ent? Yes X No	
Remarks: This data she	et is revised from Atl	lantic and	Gulf Coastal Plain	Regiona	al Supple	ement Ver	sion 2.0 to include t	ne NRCS Field Indicators of Hydric	
Soils, Version				109.01.10	Сарр.с			.o.u.co	

Project/Site: C540	City/County: Wake		Sampling Date: 8/15/17	
Applicant/Owner: NCDOT		State: NC	Sampling Point: WWE-WET	
Investigator(s): S. Easterly, T. Carter	Section, Township, Range:			
Landform (hillside, terrace, etc.): Terrace	Local relief (concave, convex, n	one): Concave	Slope (%): 1	
Subregion (LRR or MLRA): LRR P, MLRA 136 L	at: 35.653325 Long: -7	3.708683	Datum: NAD83	
Soil Map Unit Name: CeD - Cecil sandy loam, 10 to	15 percent slopes	NWI classificat	ion: PFO	
Are climatic / hydrologic conditions on the site typica	·		explain in Remarks.)	
Are Vegetation, Soil, or Hydrology	<del></del> -	cumstances" present?		
Are Vegetation, Soil, or Hydrology	naturally problematic? (If needed, expl	ain any answers in Re	marks.)	
SUMMARY OF FINDINGS – Attach site r	nap showing sampling point locatio	ns, transects, im	portant features, etc.	
Hydric Soil Present? Yes	X No Is the Sampled Area X No within a Wetland?	Yes X	No	
Remarks:				
HYDROLOGY				
Wetland Hydrology Indicators:		-	minimum of two required)	
Primary Indicators (minimum of one is required; che	• • • • • • • • • • • • • • • • • • • •	Surface Soil Crack	` '	
<del></del>	ue Aquatic Plants (B14)	Sparsely Vegetated Concave Surface (B8)  Drainage Patterns (B10)		
	rdrogen Sulfide Odor (C1) ridized Rhizospheres on Living Roots (C3)	Moss Trim Lines (B16)		
	esence of Reduced Iron (C4)			
<del></del>	ecent Iron Reduction in Tilled Soils (C6)	Dry-Season Water Table (C2)		
<del></del>	nin Muck Surface (C7)	Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9)		
<del></del>	her (Explain in Remarks)		• • • •	
Iron Deposits (B5)		Stunted or Stressed Plants (D1) Geomorphic Position (D2)		
Inundation Visible on Aerial Imagery (B7)	•	Shallow Aquitard (		
Water-Stained Leaves (B9)	-	Microtopographic	,	
Aquatic Fauna (B13)	•	X FAC-Neutral Test	` '	
Field Observations:				
Surface Water Present? Yes X No	Depth (inches): 1			
Water Table Present? Yes X No	Depth (inches): 2			
Saturation Present? Yes X No	Depth (inches): 0 Wetland H	ydrology Present?	Yes X No	
(includes capillary fringe)				
Describe Recorded Data (stream gauge, monitoring	well, aerial photos, previous inspections), if ava	nilable:		
Demodra				
Remarks: Surface Water in wetland but not where data point t	aken. Wetland is a linear feature starting at a he	eadout Is not a stream	no flow	
Curiade Water in Welland But not where data point t	akon. Welland is a linear realare starting at a ric	addat. 10 flot a diream	, no now.	

	Absolute	Dominant	Indicator	
Tree Stratum (Plot size: 30' r )	% Cover	Species?	Status	Dominance Test worksheet:
Liquidambar styraciflua	20	Yes	FAC	Number of Dominant Species
2. Acer rubrum	20	Yes	FAC	That Are OBL, FACW, or FAC:7 (A)
3. Nyssa sylvatica	20	Yes	FAC	Total Number of Dominant
4. Quercus nigra	10	No	FAC	Species Across All Strata: 8 (B)
5				Percent of Dominant Species
6.				That Are OBL, FACW, or FAC: 87.5% (A/B)
7				Prevalence Index worksheet:
		=Total Cover		Total % Cover of: Multiply by:
	<u>35</u> 20%	of total cover:	14	OBL species 0 x 1 = 0
Sapling/Shrub Stratum (Plot size: 30' r )	1			FACW species 40 x 2 = 80
Liquidambar styraciflua	20	Yes	FAC	FAC species135 x 3 =405
2. Acer rubrum	20	Yes	FAC	FACU species 20 x 4 = 80
3. Quercus nigra	10	Yes	FAC	UPL species 0 x 5 = 0
4				Column Totals: 195 (A) 565 (B)
5				Prevalence Index = B/A = 2.90
6.				Hydrophytic Vegetation Indicators:
7				1 - Rapid Test for Hydrophytic Vegetation
8				X 2 - Dominance Test is >50%
9				X 3 - Prevalence Index is ≤3.0 <sup>1</sup>
	50 :	=Total Cover		4 - Morphological Adaptations <sup>1</sup> (Provide supporting
50% of total cover: 2	25 20%	of total cover:	10	data in Remarks or on a separate sheet)
Herb Stratum (Plot size: 15' r )				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
Osmundastrum cinnamomeum	20	Yes	FACW	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
2. Polystichum acrostichoides	20	Yes	FACU	present, unless disturbed or problematic.
3. Woodwardia areolata	10	No	FACW	Definitions of Four Vegetation Strata:
4. Smilax rotundifolia	10	No	FAC	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
5. Arundinaria gigantea	10	No	FACW	more in diameter at breast height (DBH), regardless of
6. Quercus nigra	5	No	FAC	height.
7				Sapling/Shrub – Woody plants, excluding vines, less
8				than 3 in. DBH and greater than or equal to 3.28 ft
9				(1 m) tall.
10				Herb – All herbaceous (non-woody) plants, regardless
11				of size, and woody plants less than 3.28 ft tall.
	75 :	=Total Cover		Woody Vine – All woody vines greater than 3.28 ft in
50% of total cover: 3	38 20%	of total cover:	15	height.
Woody Vine Stratum (Plot size:)				
1				
2.				
3.				
4.				
5.				Hydrophysia
	:	=Total Cover		Hydrophytic Vegetation
50% of total cover:	20%	of total cover:		Present? Yes X No
Remarks: (Include photo numbers here or on a sepa	arata chaot \			
Remarks. (include prioto numbers here of on a sepa	arate Srieet.)			

Sampling Point: WWE-WET

SOIL Sampling Point: WWE-WET

Profile Desc	ription: (Describe t	o the dep	th needed to doc	ument th	ne indica	ator or co	onfirm the absence	of indicators.)
Depth	Matrix		Redo	x Featur	es			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-2	10yr 3/1	100					Sandy	
2-10	10yr 4/2	90	5yr 4/4	10	С	M		Prominent redox concentrations
10-14	N 6/	90	5yr 4/6	10	<u>C</u>	<u>M</u>	Loamy/Clayey	Prominent redox concentrations
					<u> </u>	<u> </u>		
<sup>1</sup> Type: C=Co	oncentration, D=Deple	etion. RM:	=Reduced Matrix. N	/S=Masl	ked Sand	d Grains.	<sup>2</sup> l ocatio	n: PL=Pore Lining, M=Matrix.
Hydric Soil		otion, reivi-	-reduced Matrix, is	/IO=IVIASI	ica Garic	Oranio.		cators for Problematic Hydric Soils <sup>3</sup> :
Histosol Histic Ep Black His	(A1) pipedon (A2)		Polyvalue Bo Thin Dark So Loamy Muck X Loamy Gley	urface (S xy Minera	69) <b>(MLR</b> al (F1) <b>(N</b>	A 147, 14	147, 148) 48) 6)	2 cm Muck (A10) (MLRA 147) Coast Prairie Redox (A16) (MLRA 147, 148) Piedmont Floodplain Soils (F19)
Stratified	Layers (A5)		Depleted Ma	trix (F3)				(MLRA 136, 147)
2 cm Mu	ck (A10) (LRR N)		Redox Dark	Surface	(F6)			Red Parent Material (F21)
Depleted	l Below Dark Surface	(A11)	Depleted Da	rk Surfa	ce (F7)			(outside MLRA 127, 147, 148)
Thick Da	ark Surface (A12)		Redox Depre	essions (	(F8)			Very Shallow Dark Surface (F22)
	lucky Mineral (S1)		Iron-Mangar	ese Mas	sses (F12	2) <b>(LRR N</b>	l,	Other (Explain in Remarks)
	leyed Matrix (S4)		MLRA 136					
	edox (S5)		Umbric Surfa					icators of hydrophytic vegetation and
	Matrix (S6)		Piedmont Fl					wetland hydrology must be present,
Dark Sui	face (S7)		Red Parent	Material	(F21) <b>(M</b>	LRA 127	, 147, 148)	unless disturbed or problematic.
Restrictive I	_ayer (if observed):							
Type:								
Depth (ir	nches):						Hydric Soil Pres	ent? Yes X No
Remarks: This data she Soils, Versio		astern Mou	untains and Piedmo	ont Regio	onal Sup	plement \	Version 2.0 to includ	e the NRCS Field Indicators of Hydric

Project/Site: C540	City/County:	Wake	Sampling Date: 8/14/17		
Applicant/Owner: NCDOT		State: NC	Sampling Point: WWE-UP		
Investigator(s): S. Easterly, T. Carter	Section, Townsh	ip, Range:			
Landform (hillside, terrace, etc.): hillslope	Local relief (concave	e, convex, none): convex	Slope (%):1		
Subregion (LRR or MLRA): LRR P, MLRA 13	6 Lat: 35.653402	Long: -78.708674	Datum: NAD83		
Soil Map Unit Name: CeD - Cecil sandy loam		NWI classifica	tion: UPL		
Are climatic / hydrologic conditions on the site	·		explain in Remarks.)		
Are Vegetation, Soil, or Hydrold		"Normal Circumstances" present			
Are Vegetation, Soil, or Hydrold		eeded, explain any answers in Re			
<del></del>					
SUMMARY OF FINDINGS – Attach	site map showing sampling poir	nt locations, transects, im	portant features, etc.		
Hydrophytic Vegetation Present?	Yes X No Is the Sample	d Area			
	Yes No X within a Wetla		No X		
Wetland Hydrology Present?	Yes No X				
Remarks:	-				
HYDROLOGY					
Wetland Hydrology Indicators:		<u> </u>	(minimum of two required)		
Primary Indicators (minimum of one is require		Surface Soil Crac	` ,		
Surface Water (A1)	True Aquatic Plants (B14)		Sparsely Vegetated Concave Surface (B8)		
High Water Table (A2)	Hydrogen Sulfide Odor (C1)	Drainage Pattern			
Saturation (A3)	Oxidized Rhizospheres on Living Root				
Water Marks (B1)	Presence of Reduced Iron (C4)	Dry-Season Water			
Sediment Deposits (B2)	Recent Iron Reduction in Tilled Soils (				
Drift Deposits (B3) Algal Mat or Crust (B4)	Thin Muck Surface (C7)		on Aerial Imagery (C9)		
Iron Deposits (B5)	Other (Explain in Remarks)		Stunted or Stressed Plants (D1) Geomorphic Position (D2)		
Inundation Visible on Aerial Imagery (B7)		Shallow Aquitard	, ,		
Water-Stained Leaves (B9)		Microtopographic			
Aquatic Fauna (B13)		FAC-Neutral Test			
Field Observations:		<u> </u>			
Surface Water Present? Yes	No X Depth (inches): 0				
Water Table Present? Yes					
Saturation Present? Yes	No X Depth (inches): 0	Wetland Hydrology Present?	Yes No X		
(includes capillary fringe)					
Describe Recorded Data (stream gauge, mor	itoring well, aerial photos, previous inspec	tions), if available:			
Parada					
Remarks:					

Total Officials (Plate) and OOLs	Absolute	Dominant	Indicator	Barrier Tart was dark and
Tree Stratum (Plot size: 30' r )	% Cover	Species?	Status	Dominance Test worksheet:
1. Quercus nigra	20	Yes	FAC	Number of Dominant Species
2. Acer rubrum	20	Yes	FAC	That Are OBL, FACW, or FAC:5(A)
3. Liquidambar styraciflua	20	Yes	FAC	Total Number of Dominant
4.				Species Across All Strata: 8 (B)
5				Percent of Dominant Species
6.				That Are OBL, FACW, or FAC: 62.5% (A/B)
7				Prevalence Index worksheet:
	60 =	=Total Cover		Total % Cover of: Multiply by:
50% of total cover:	30 20%	of total cover:	12	OBL species 0 x 1 = 0
Sapling/Shrub Stratum (Plot size: 30' r	)			FACW species 0 x 2 = 0
1. Acer rubrum	30	Yes	FAC	FAC species110 x 3 =330
2. Liquidambar styraciflua	20	Yes	FAC	FACU species 35 x 4 = 140
3.				UPL species 0 x 5 = 0
4.				Column Totals: 145 (A) 470 (B)
5.				Prevalence Index = B/A = 3.24
6.				Hydrophytic Vegetation Indicators:
7.				1 - Rapid Test for Hydrophytic Vegetation
8.				X 2 - Dominance Test is >50%
9.				3 - Prevalence Index is ≤3.0¹
<u> </u>	50 :	=Total Cover		4 - Morphological Adaptations <sup>1</sup> (Provide supporting
F00/ of total accord			40	data in Remarks or on a separate sheet)
	<u>25</u> 20%	of total cover:	10	
Herb Stratum (Plot size: 15' r )		.,	= 4 0 1 1	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
1. Ilex opaca	10	Yes	FACU	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
2. Polystichum acrostichoides	10	Yes	FACU	present, unless disturbed or problematic.
3. Lonicera japonica	10	Yes	FACU	Definitions of Four Vegetation Strata:
4. Ligustrum sinense	5	No	FACU	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
5				more in diameter at breast height (DBH), regardless of
6.				height.
7				Sapling/Shrub – Woody plants, excluding vines, less
8				than 3 in. DBH and greater than or equal to 3.28 ft
9				(1 m) tall.
10.				Herb – All herbaceous (non-woody) plants, regardless
11.				of size, and woody plants less than 3.28 ft tall.
	35 :	=Total Cover		Woody Vine – All woody vines greater than 3.28 ft in
50% of total cover:		of total cover:	7	height.
Woody Vine Stratum (Plot size: )				
1 2.				
-				
3.				
4.				
5				Hydrophytic
		=Total Cover		Vegetation
50% of total cover:	20%	of total cover:		Present? Yes X No No
Remarks: (Include photo numbers here or on a sep	arate sheet.)			

Sampling Point:

WWE-UP

**SOIL** Sampling Point: WWE-UP

	ription: (Describe t	o the de				ator or co	onfirm the abse	ence of indi	cators.)	
Depth (inches)	Matrix Color (moist)	%		x Featu		Loc <sup>2</sup>	Toyturo		Dom	orko
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	LOC	Texture		Rem	arks
0-12	10yr 3/4	100					Loamy/Claye	у	some	sand
<sup>1</sup> Type: C=Co	ncentration, D=Deple	etion RM	=Reduced Matrix N	/IS=Mas	ked Sand		2l oc	eation: PI =F	Pore Lining, M	l=Matrix
Hydric Soil I		011011, 1111	in reduced matrix, is	no-mac	nou can	oranio.				tic Hydric Soils <sup>3</sup> :
Histosol			Polyvalue Be	elow Su	rface (S8	(MLRA			uck (A10) <b>(ML</b>	-
	ipedon (A2)		Thin Dark S			-			rairie Redox	
Black His			Loamy Muck						A 147, 148)	,
	n Sulfide (A4)		Loamy Gley	-			,	•	nt Floodplain	Soils (F19)
	Layers (A5)		Depleted Ma				•		A 136, 147)	,
	ck (A10) (LRR N)		Redox Dark					•	rent Material (	(F21)
Depleted	Below Dark Surface	(A11)	Depleted Da	rk Surfa	ace (F7)		•	(outs	ide MLRA 12	7, 147, 148)
Thick Da	rk Surface (A12)		Redox Depre	essions	(F8)			Very Sh	allow Dark Su	urface (F22)
Sandy M	ucky Mineral (S1)		Iron-Mangar	nese Ma	sses (F12	2) <b>(LRR N</b>	١,	Other (F	Explain in Ren	narks)
Sandy Gl	eyed Matrix (S4)		MLRA 136	6)						
Sandy Re	edox (S5)		Umbric Surfa	ace (F13	3) <b>(MLRA</b>	122, 136	6)	<sup>3</sup> Indicators of	of hydrophytic	vegetation and
Stripped	Matrix (S6)		Piedmont Fl	oodplair	Soils (F	19) <b>(MLR</b>	A 148)	wetland	hydrology mu	ust be present,
Dark Sur	face (S7)		Red Parent	Material	(F21) <b>(M</b>	LRA 127	, 147, 148)	unless	disturbed or p	roblematic.
Restrictive L	ayer (if observed):									
Type:										
Depth (in	ches):						Hydric Soil F	Present?	Yes	No <u>X</u>
Remarks:										
	et is revised from Ea	astern Mo	ountains and Piedmo	ont Regi	onal Sup	plement \	Version 2.0 to in	clude the NF	RCS Field Ind	icators of Hydric
Soils, Versior	1 8.0, 2016.									

Project/Site: C540	City/County: Wake	Sampling D	Date: 8/15/17
Applicant/Owner: NCDOT		State: NC Sampling F	oint: WWF-WET
Investigator(s): S. Easterly, T. Carter	Section, Township, Range:		
Landform (hillside, terrace, etc.): floodplain	Local relief (concave, convex, no	one): convave Slope	(%): 1
Subregion (LRR or MLRA): LRR P, MLRA 136	Lat: 35.658437 Long: -78	3.702004 Datu	m: NAD83
Soil Map Unit Name: WaC - Wagram loamy sar		NWI classification: PFO	
Are climatic / hydrologic conditions on the site ty		No (If no, explain in Re	marks )
Are Vegetation, Soil, or Hydrology			X No
Are Vegetation, Soil, or Hydrology		ain any answers in Remarks.)	
	te map showing sampling point location		atures, etc.
Hydrophytic Vegetation Present? Ye Hydric Soil Present? Ye Wetland Hydrology Present? Ye	s X No within a Wetland?	Yes X No	
HYDROLOGY			
		Sacandary Indicators (minimum of	two required)
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required;	·	Secondary Indicators (minimum of Surface Soil Cracks (B6)	two required)
Surface Water (A1)	True Aquatic Plants (B14)	Sparsely Vegetated Concave	Surface (B8)
X High Water Table (A2)	<del>-</del>	X Drainage Patterns (B10)	( -,
X Saturation (A3)	Oxidized Rhizospheres on Living Roots (C3)	Moss Trim Lines (B16)	
Water Marks (B1)	Presence of Reduced Iron (C4)	Dry-Season Water Table (C2)	
Sediment Deposits (B2)	Recent Iron Reduction in Tilled Soils (C6)	Crayfish Burrows (C8)	
Drift Deposits (B3)	_Thin Muck Surface (C7)	Saturation Visible on Aerial Im	agery (C9)
Algal Mat or Crust (B4)	Other (Explain in Remarks)	Stunted or Stressed Plants (D	1)
Iron Deposits (B5)	-	Geomorphic Position (D2)	
Inundation Visible on Aerial Imagery (B7)	-	Shallow Aquitard (D3)	
X Water-Stained Leaves (B9)	<u>-</u>	Microtopographic Relief (D4)	
Aquatic Fauna (B13)	<del>_</del>	FAC-Neutral Test (D5)	
Field Observations:			
Surface Water Present? Yes N	Depth (inches): 0		
Water Table Present? Yes X N	0 X         Depth (inches):         0           0 Depth (inches):         2           0 Depth (inches):         0           Wetland Hy	rdralamy Dragant? Vac	V No
Saturation Present? Yes X N (includes capillary fringe)	Depth (inches): 0 wetland Hy	drology Present? Yes_	X No
	pring well, aerial photos, previous inspections), if ava	ilable:	
Doconso (tocordos Data (otrosim gaugo, monte	This work actual process, provided inopositions, in available		
Remarks:			
Surface Water in wetland but not where data po	int was taken.		
·			

	Absolute		Indicator	
Tree Stratum (Plot size: 30' r )	% Cove	r Species?	Status	Dominance Test worksheet:
1. Acer rubrum	40	Yes	FAC	Number of Dominant Species
2. Quercus nigra	20	Yes	FAC	That Are OBL, FACW, or FAC:(A)
3. Liquidambar styraciflua	20	Yes	FAC	Total Number of Dominant
4. <u>Ulmus americana</u>	10	No	FACW	Species Across All Strata: 13 (B)
5	_			Percent of Dominant Species
6				That Are OBL, FACW, or FAC:76.9%(A/B)
7.				Prevalence Index worksheet:
	90	=Total Cover		Total % Cover of: Multiply by:
50% of total cover:	45 20	% of total cover	: 18	OBL species 0 x 1 = 0
Sapling/Shrub Stratum (Plot size: 30' r	)			FACW species 50 x 2 = 100
1. Ligustrum sinense	20	Yes	FACU	FAC species 150 x 3 = 450
2. Acer rubrum	10	Yes	FAC	FACU species 40 x 4 = 160
3.				UPL species 0 x 5 = 0
4.	_			Column Totals: 240 (A) 710 (B)
5.		_		Prevalence Index = $B/A = 2.96$
6.	_			Hydrophytic Vegetation Indicators:
7.				1 - Rapid Test for Hydrophytic Vegetation
				1 <u>—</u>
8.	_			X 2 - Dominance Test is >50% X 3 - Prevalence Index is ≤3.0 <sup>1</sup>
9				
	30	_=Total Cover	_	4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
50% of total cover:	15 20	% of total cover	:6	
Herb Stratum (Plot size: 15' r )				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
Arundinaria gigantea	40	Yes	FACW	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
2. Microstegium vimineum	20	Yes	FAC	present, unless disturbed or problematic.
3. Rubus argutus	10	Yes	FACU	Definitions of Four Vegetation Strata:
4. Smilax rotundifolia	10	Yes	FAC	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
5. Quercus phellos	10	Yes	FAC	more in diameter at breast height (DBH), regardless of
6. Quercus nigra	10	Yes	FAC	height.
7. Parthenocissus quinquefolia	10	Yes	FACU	Sapling/Shrub – Woody plants, excluding vines, less
8. Toxicodendron radicans	10	Yes	FAC	than 3 in. DBH and greater than or equal to 3.28 ft
9.				(1 m) tall.
10.				Herb – All herbaceous (non-woody) plants, regardless
11.				of size, and woody plants less than 3.28 ft tall.
	120	=Total Cover		Woody Vine – All woody vines greater than 3.28 ft in
50% of total cover:	60 20	— I% of total cover	: 24	height.
Woody Vine Stratum (Plot size:	)			
<u></u>	.′			
2		_		
1				
5.	_	T-1-1-0		Hydrophytic
500/ // /		_=Total Cover		Vegetation
50% of total cover:		% of total cover	:	Present? Yes X No No
Remarks: (Include photo numbers here or on a s	separate sheet	.)		

Sampling Point: WWF-WET

SOIL Sampling Point: WWF-WET

Profile Desc	ription: (Describe t	o the depti	needed to docu	ment tl	ne indica	tor or co	onfirm the absence	of indicators.)
Depth	Matrix		Redox	(Featur	es			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-12	10yr 4/1	90	5yr 4/6	10	С	М	Loamy/Clayey	Prominent redox concentrations
							·	
<sup>1</sup> Type: C=Co	oncentration, D=Deple	etion, RM=F	Reduced Matrix, M	IS=Mas	ked Sand	l Grains.		: PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators:							cators for Problematic Hydric Soils <sup>3</sup> :
Histosol			Polyvalue Be			•		2 cm Muck (A10) <b>(MLRA 147)</b>
	ipedon (A2)		Thin Dark Su	•	, .		· —	Coast Prairie Redox (A16)
Black His	,		Loamy Muck			ILRA 136	-	(MLRA 147, 148)
	n Sulfide (A4)		Loamy Gleye				!	Piedmont Floodplain Soils (F19)
	Layers (A5)		X Depleted Ma					(MLRA 136, 147)
	ck (A10) <b>(LRR N)</b>		Redox Dark		` '		!	Red Parent Material (F21)
	Below Dark Surface	(A11)	Depleted Dai					(outside MLRA 127, 147, 148)
	rk Surface (A12)		Redox Depre					/ery Shallow Dark Surface (F22)
	ucky Mineral (S1)		Iron-Mangan		sses (F12	2) (LRR I	N,	Other (Explain in Remarks)
	leyed Matrix (S4)		MLRA 136		·	100 100	31	antana af hardranka dia arawatadian arad
	edox (S5)		Umbric Surfa				-	cators of hydrophytic vegetation and
	Matrix (S6)		Piedmont Flo					wetland hydrology must be present,
	face (S7)		Red Parent N	лацепа	(FZI) <b>(IVI</b>	LKA 121	, 147, 146) I	unless disturbed or problematic.
	ayer (if observed):							
Type:	-h \.						Uhadaia Cail Basas	water V No
Depth (in	icnes):						Hydric Soil Prese	ent? Yes <u>X</u> No
Remarks:	not in raying from Ea	otorn Mour	stains and Diadma	nt Bogi	anal Sun	olomont \	Varaian 2 0 to include	the NDCS Field Indicators of Hydria
Soils, Version		istern wour	itains and Pledino	ni Kegi	onai Sup	Siement	version 2.0 to include	the NRCS Field Indicators of Hydric
Cono, voroioi	10.0, 2010.							

Project/Site: C540	City/County: V	Vake	Sampling Date: 8/15/17		
Applicant/Owner: NCDOT		State: NC	Sampling Point: WWF-UP		
Investigator(s): S. Easterly, T. Carter	Section, Township	, Range:			
Landform (hillside, terrace, etc.): Flat	Local relief (concave,	convex, none): convex	Slope (%):1		
Subregion (LRR or MLRA): LRR P, MLRA 1	36 Lat: 35.658515	Long: -78.701979	Datum: NAD83		
Soil Map Unit Name: MeA - Mantachie sand	ly loam, 0 to 2 percent slopes, rarely flooded	NWI classifica	tion: UPL		
Are climatic / hydrologic conditions on the site		s X No (If no, e	explain in Remarks.)		
Are Vegetation , Soil , or Hydro		Normal Circumstances" present?			
Are Vegetation, Soil, or Hydro		eded, explain any answers in Re			
SUMMARY OF FINDINGS – Attach					
Hydrophytic Vegetation Present?	Yes X No Is the Sampled	Area			
Hydric Soil Present?	Yes No X within a Wetlan		No X		
Wetland Hydrology Present?	Yes No X				
Remarks:	<u>.</u>				
HYDROLOGY					
Wetland Hydrology Indicators:		·	(minimum of two required)		
Primary Indicators (minimum of one is required		Surface Soil Crac	` '		
Surface Water (A1)	True Aquatic Plants (B14)		ed Concave Surface (B8)		
High Water Table (A2)	Hydrogen Sulfide Odor (C1)	Drainage Patterns			
Saturation (A3)	Oxidized Rhizospheres on Living Roots		Moss Trim Lines (B16)		
Water Marks (B1)	Presence of Reduced Iron (C4)	Dry-Season Wate			
Sediment Deposits (B2)	Recent Iron Reduction in Tilled Soils (C				
Drift Deposits (B3)	Thin Muck Surface (C7)		on Aerial Imagery (C9)		
Algal Mat or Crust (B4)	Other (Explain in Remarks)	Stunted or Stresson Geomorphic Posit	` '		
Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7	7)	Shallow Aquitard	, ,		
Water-Stained Leaves (B9)	,	Microtopographic			
Aquatic Fauna (B13)		FAC-Neutral Test	, ,		
Field Observations:			(50)		
Surface Water Present? Yes	No X Depth (inches): 0				
	No X Depth (inches): 0				
Saturation Present? Yes		Vetland Hydrology Present?	Yes No X		
·			<u></u>		
(includes capillary fringe)		\ '' '' '' '' '' '' '' '' '' '' '' '' ''			
(includes capillary fringe)  Describe Recorded Data (stream gauge, mo	nitoring well, aerial photos, previous inspection	ons), if available:			
	onitoring well, aerial photos, previous inspection	ons), if available:			
	onitoring well, aerial photos, previous inspection	ons), if available:			
	onitoring well, aerial photos, previous inspection	ons), if available:			
Describe Recorded Data (stream gauge, mo	onitoring well, aerial photos, previous inspecti	ons), if available:			
Describe Recorded Data (stream gauge, mo	onitoring well, aerial photos, previous inspecti	ons), if available:			
Describe Recorded Data (stream gauge, mo	onitoring well, aerial photos, previous inspecti	ons), if available:			
Describe Recorded Data (stream gauge, mo	onitoring well, aerial photos, previous inspecti	ons), if available:			
Describe Recorded Data (stream gauge, mo	onitoring well, aerial photos, previous inspecti	ons), if available:			
Describe Recorded Data (stream gauge, mo	onitoring well, aerial photos, previous inspecti	ons), if available:			
Describe Recorded Data (stream gauge, mo	onitoring well, aerial photos, previous inspecti	ons), if available:			
Describe Recorded Data (stream gauge, mo	onitoring well, aerial photos, previous inspecti	ons), if available:			

	Absolute	Dominant	Indicator	
Tree Stratum (Plot size:30' r)	% Cover	Species?	Status	Dominance Test worksheet:
1. Acer rubrum	20	Yes	FAC	Number of Dominant Species
Liquidambar styraciflua	10	Yes	FAC	That Are OBL, FACW, or FAC:4 (A)
3. Pinus taeda	5	No	FAC	Total Number of Dominant
4				Species Across All Strata: 6 (B)
5				Percent of Dominant Species
6				That Are OBL, FACW, or FAC: 66.7% (A/B)
7				Prevalence Index worksheet:
		=Total Cover		Total % Cover of: Multiply by:
50% of total cover: 18	3 20%	of total cover:	7	OBL species 0 x 1 = 0
Sapling/Shrub Stratum (Plot size: 30' r )				FACW species 0 x 2 = 0
1. Acer rubrum	10	Yes	FAC	FAC species 55 x 3 = 165
Liquidambar styraciflua	10	Yes	FAC	FACU species 75 x 4 = 300
3. Ligustrum sinense	5	Yes	FACU	UPL species 0 x 5 = 0
4.				Column Totals: 130 (A) 465 (B)
5				Prevalence Index = B/A = 3.58
6				Hydrophytic Vegetation Indicators:
7.				1 - Rapid Test for Hydrophytic Vegetation
8		·		X 2 - Dominance Test is >50%
9.				3 - Prevalence Index is ≤3.0 <sup>1</sup>
	25	=Total Cover		4 - Morphological Adaptations <sup>1</sup> (Provide supporting
50% of total cover:13	3 20%	of total cover:	5	data in Remarks or on a separate sheet)
Herb Stratum (Plot size:15' r)				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
Schedonorus arundinaceus	60	Yes	FACU	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
2. Plantago major	10	No	FACU	present, unless disturbed or problematic.
3.				Definitions of Four Vegetation Strata:
4.				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
5.				more in diameter at breast height (DBH), regardless of
6.				height.
7.				Sapling/Shrub – Woody plants, excluding vines, less
8.				than 3 in. DBH and greater than or equal to 3.28 ft
9.				(1 m) tall.
10.				Herb – All herbaceous (non-woody) plants, regardless
11.				of size, and woody plants less than 3.28 ft tall.
	70	=Total Cover		Woody Vine – All woody vines greater than 3.28 ft in
50% of total cover: 35	5 20%	of total cover:	14	height.
Woody Vine Stratum (Plot size: )				
1.				
2.				
3.				
4.				
5.				
·		=Total Cover		Hydrophytic
50% of total cover:		of total cover:		Vegetation Present? Yes X No
		Or total cover.		1103CH: 103 HO
Remarks: (Include photo numbers here or on a sepa	rate sheet.)			

Sampling Point: WWF-UP

**SOIL** Sampling Point: WWF-UP

	ription: (Describe t	o the dep				itor or co	nfirm the abse	ence of indic	cators.)	
Depth	Matrix			x Featur		. 2	<b>-</b> .			
(inches)	Color (moist)	<u>%</u>	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Rem	narks
0-12	10yr 3/4	100								
			_							_
1 <sub>Tyme</sub> , C. Co	anapatration D Donl		Doduced Metrix N		Lod Cond		21.00	notion: DL F	Doro Lining N	1 Motrix
	ncentration, D=Deple	etion, Rivi	=Reduced Matrix, N	/IS=IVIAS	ked Sand	Grains.	Loc		Pore Lining, N	natic Hydric Soils <sup>3</sup> :
Hydric Soil I			Doharelue Pr	olow Cur	rfano (CO)	/MI DA :	147 140\			-
Histosol			Polyvalue Be Thin Dark Se		` '	•			uck (A10) <b>(M</b>	•
	ipedon (A2)			•			•		rairie Redox	(A16)
Black His	, ,		Loamy Muck	-		ILKA 130	,	-	A 147, 148)	Coile (F10)
	n Sulfide (A4) Layers (A5)		Loamy Gley						nt Floodplain <b>A 136, 147)</b>	30lls (F19)
	ck (A10) <b>(LRR N)</b>		Depleted Ma Redox Dark					•	rent Material	(E21)
	Below Dark Surface	(Δ11)	Depleted Da				•			(121) 27, 147, 148)
	rk Surface (A12)	(Д11)	Redox Depre					•	allow Dark S	
	ucky Mineral (S1)		Iron-Mangar			) <b>(I RR N</b>			Explain in Re	
	leyed Matrix (S4)		MLRA 136		0000 (I 12	-) ( <b>-</b> 1(1( 1(	,		-Apiaiii iii ito	marko)
	edox (S5)		Umbric Surfa	•	3) <b>(MLRA</b>	122. 136	)	<sup>3</sup> Indicators of	of hydrophytic	vegetation and
	Matrix (S6)		Piedmont Fl							ust be present,
	face (S7)		Red Parent				-		disturbed or p	-
Restrictive L	.ayer (if observed):		_		. , ,				·	
Type:	, ,									
Depth (in	ches):						Hydric Soil I	Present?	Yes	No X
Remarks:	-					•				
	et is revised from Ea	stern Mou	untains and Piedmo	ont Regi	onal Sup	olement V	ersion 2.0 to in	clude the NF	RCS Field Inc	licators of Hydric
Soils, Version	n 8.0, 2016.									-

Project/Site: C540	City/County: Wake	)	Sampling Date:	8/16/17			
Applicant/Owner: NCDOT		State: NC	Sampling Point:	WWG-WET			
Investigator(s): S. Easterly, T. Carter	Section, Township, Ra	.nge:					
Landform (hillside, terrace, etc.): hillslope	Local relief (concave, conv	vex, none): concave	Slope (%):	1			
Subregion (LRR or MLRA): LRR P, MLRA 136	Lat: 35.778017 Lor	ng: -78.509199	Datum:	NAD83			
Soil Map Unit Name: ApD - Appling sandy loam		NWI classificat	tion: PSS				
Are climatic / hydrologic conditions on the site ty			explain in Remark	s )			
Are Vegetation, Soil, or Hydrology		nal Circumstances" present?					
Are Vegetation, Soil, or Hydrology	/naturally problematic? (If needed	d, explain any answers in Re	marks.)				
SUMMARY OF FINDINGS – Attach si		cations, transects, im	portant featu	res, etc.			
Hydrophytic Vegetation Present? Ye Hydric Soil Present? Ye Wetland Hydrology Present? Ye	s X No within a Wetland?	Yes <u>X</u>	No				
Remarks:							
HYDROLOGY							
Wetland Hydrology Indicators:	about all that apply)	Secondary Indicators (	•	<u>required)</u>			
Primary Indicators (minimum of one is required; X Surface Water (A1)	True Aquatic Plants (B14)	Surface Soil Crack	` '	co (B9)			
<u> </u>	Hydrogen Sulfide Odor (C1)		Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10)				
	Oxidized Rhizospheres on Living Roots (C3)		Moss Trim Lines (B16)				
Water Marks (B1)	Presence of Reduced Iron (C4)	Dry-Season Water					
Sediment Deposits (B2)	Recent Iron Reduction in Tilled Soils (C6)	X Crayfish Burrows					
Drift Deposits (B3)	Thin Muck Surface (C7)	Saturation Visible		/ (C9)			
Algal Mat or Crust (B4)	Other (Explain in Remarks)	Stunted or Stresse		, ,			
Iron Deposits (B5)	-	Geomorphic Posit	tion (D2)				
Inundation Visible on Aerial Imagery (B7)		Shallow Aquitard (	(D3)				
X Water-Stained Leaves (B9)		Microtopographic	Relief (D4)				
Aquatic Fauna (B13)		FAC-Neutral Test	(D5)				
Field Observations:							
Surface Water Present? Yes X N	Depth (inches): 2						
Water Table Present? Yes X N	Depth (inches): 0 Depth (inches): 0 Wetla						
	Depth (inches): 0 Wetla	and Hydrology Present?	Yes X	No			
(includes capillary fringe)							
Describe Recorded Data (stream gauge, monito	ring well, aerial photos, previous inspections),	, if available:					
Remarks:							
Surface water in wetland but not where datapoir	ıt taken.						

Tree Stratum (Plot size: )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1.	70 00:11	<u> </u>		
2.				Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
3.				
4.				Total Number of Dominant Species Across All Strata: 3 (B)
5.				``
6.				Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)
7.				Prevalence Index worksheet:
<i>'</i>		=Total Cover		Total % Cover of: Multiply by:
50% of total cover:		of total cover:		OBL species 0 x 1 = 0
Sapling/Shrub Stratum (Plot size: 30' r )				FACW species 70 x 2 = 140
1. Ilex opaca	20	Yes	FACU	FAC species 60 x 3 = 180
2. Acer rubrum	20	Yes	FAC	FACU species 50 x 4 = 200
3. Liquidambar styraciflua	10	No	FAC	UPL species 0 x 5 = 0
4. Ligustrum sinense	10	No	FACU	Column Totals: 180 (A) 520 (B)
5.				Prevalence Index = B/A = 2.89
6.				Hydrophytic Vegetation Indicators:
7.				1 - Rapid Test for Hydrophytic Vegetation
8.				X 2 - Dominance Test is >50%
9.				X 3 - Prevalence Index is ≤3.0¹
<u> </u>	60 =	=Total Cover		4 - Morphological Adaptations <sup>1</sup> (Provide supporting
FOO/ of total account 20			10	data in Remarks or on a separate sheet)
50% of total cover: 30	20%	of total cover:	12	
Herb Stratum (Plot size: 15' r )	70		E4.014/	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
1. Arundinaria gigantea	70	Yes	FACW	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
2. Smilax rotundifolia	20	No	FAC	present, unless disturbed or problematic.
3. <u>Ilex opaca</u>	20	No	FACU	Definitions of Four Vegetation Strata:
4. Vitis rotundifolia	10	No	FAC	<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
5.				more in diameter at breast height (DBH), regardless of
6				height.
7				Sapling/Shrub – Woody plants, excluding vines, less
8				than 3 in. DBH and greater than or equal to 3.28 ft
9				(1 m) tall.
10				Herb – All herbaceous (non-woody) plants, regardless
11				of size, and woody plants less than 3.28 ft tall.
	120 :	=Total Cover		Woody Vine - All woody vines greater than 3.28 ft in
50% of total cover: 60	20%	of total cover:	24	height.
Woody Vine Stratum (Plot size: )				
1.				
2.				
3.				
4.				
5.				
		=Total Cover		Hydrophytic
50% of total cover:		of total cover:		Vegetation Present? Yes X No
	· · · · · · · · · · · · · · · · · · ·	or total cover.		11050HC. 105 <u>X</u> 110
Remarks: (Include photo numbers here or on a separ	ate sheet.)			

Sampling Point: WWG-WET

SOIL Sampling Point: WWG-WET

Profile Desc	ription: (Describe	to the dep	th needed to doc	ument t	he indica	ator or co	onfirm the absence	of indicators.)
Depth	Matrix		Redo	x Featu	res			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-8	10yr 4/2	90	5yr 4/6	10	C_	М	Loamy/Clayey	Prominent redox concentrations
8-14	10yr 3/1	100	_				Loamy/Clayey	
	10y1 0/1	100					Louiny/ Olayey	
<sup>1</sup> Type: C=Co	ncentration, D=Depl	etion, RM:	=Reduced Matrix, N	/IS=Mas	ked Sand	d Grains.	<sup>2</sup> Locatio	n: PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators:						Indi	cators for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Be	elow Su	rface (S8	(MLRA	147, 148)	2 cm Muck (A10) (MLRA 147)
Histic Ep	ipedon (A2)		Thin Dark S	urface (S	S9) <b>(MLR</b>	A 147, 1	48)	Coast Prairie Redox (A16)
Black His	` '		Loamy Mucl			ILRA 130	-	(MLRA 147, 148)
	n Sulfide (A4)		Loamy Gley		, ,			Piedmont Floodplain Soils (F19)
	Layers (A5)		X Depleted Ma					(MLRA 136, 147)
	ck (A10) (LRR N)	(044)	Redox Dark		` '			Red Parent Material (F21)
	Below Dark Surface rk Surface (A12)	(ATT)	Depleted Da					(outside MLRA 127, 147, 148) Very Shallow Dark Surface (F22)
	ucky Mineral (S1)		Iron-Mangar		` '	2) <b>(I RR I</b>		Other (Explain in Remarks)
	leyed Matrix (S4)		MLRA 136		0000 (1 12	-) <b>(=</b> :\\\\\\\\\		Citier (Explain in Remaine)
	edox (S5)		Umbric Surfa		3) <b>(MLRA</b>	122, 136	<b>3</b> Ind	icators of hydrophytic vegetation and
	Matrix (S6)		Piedmont Fl				-	wetland hydrology must be present,
Dark Sur	face (S7)		Red Parent	Material	(F21) <b>(M</b>	LRA 127	r, 147, 148)	unless disturbed or problematic.
Restrictive L	ayer (if observed):							
Type:								
Depth (in	iches):						Hydric Soil Pres	ent? Yes X No No
Remarks: This data she Soils, Version		astern Mo	untains and Piedmo	ont Regi	onal Sup	plement '	Version 2.0 to includ	e the NRCS Field Indicators of Hydric

Project/Site: C540	City/County: Wake	Sampling Date: 8/16/17			
Applicant/Owner: NCDOT	State	e: NC Sampling Point: WWG-UP			
Investigator(s): S. Easterly, T. Carter	Section, Township, Range:				
Landform (hillside, terrace, etc.): Hillslope	Local relief (concave, convex, none): slope	e Slope (%): 1			
Subregion (LRR or MLRA): LRR P, MLRA 136	Lat: 35.778098 Long: -78.509125	Datum: NAD83			
Soil Map Unit Name: ApD - Appling sandy loar	<del></del>	I classification: UPL			
Are climatic / hydrologic conditions on the site ty		(If no, explain in Remarks.)			
Are Vegetation, Soil, or Hydrolog	<del></del>	<del>-</del> ` ' '			
Are Vegetation, Soil, or Hydrolog		· — —			
<del></del>	ite map showing sampling point locations, trans				
Hydric Soil Present? You	es	/es No_X_			
Remarks:					
HYDROLOGY					
Wetland Hydrology Indicators:	•	Indicators (minimum of two required)			
Primary Indicators (minimum of one is required		e Soil Cracks (B6)			
Surface Water (A1)		ely Vegetated Concave Surface (B8)			
High Water Table (A2) Saturation (A3)	<del></del>	Drainage Patterns (B10)  Moss Trim Lines (B16)			
Water Marks (B1)	<del></del>	ason Water Table (C2)			
Sediment Deposits (B2)	<del></del>	h Burrows (C8)			
Drift Deposits (B3)		tion Visible on Aerial Imagery (C9)			
Algal Mat or Crust (B4)	<del></del>	d or Stressed Plants (D1)			
Iron Deposits (B5)	<del></del>	orphic Position (D2)			
Inundation Visible on Aerial Imagery (B7)	Shallov	w Aquitard (D3)			
Water-Stained Leaves (B9)	Microto	ppographic Relief (D4)			
Aquatic Fauna (B13)	FAC-Ne	eutral Test (D5)			
Field Observations:					
Surface Water Present? Yes	No X Depth (inches): 0				
Water Table Present? Yes					
<u> </u>	No X Depth (inches): 0 Wetland Hydrology P	Present? Yes NoX			
(includes capillary fringe)  Describe Recorded Data (stream gauge, monit	Ltoring well, aerial photos, previous inspections), if available:				
Bosonibe (Neseridea Bata (Stream gauge, month	orning won, acrial priotocs, provided inspections), il available.				
Remarks:					

<u>Tree Stratum</u> (Plot size: 30' r )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. Carya tomentosa	20	Yes	UPL	Number of Dominant Species	
Quercus rubra	20	Yes	FACU	· ·	(A)
3. Acer rubrum	10	No	FAC	Total Number of Dominant	,
4. Liquidambar styraciflua	10	No	FAC		(B)
5. Quercus nigra	10	No	FAC	Percent of Dominant Species	` ,
6.				·	(A/B)
7.				Prevalence Index worksheet:	, ,
	70 :	=Total Cover		Total % Cover of: Multiply by:	
50% of total cover:	35 20%	of total cover:	14	OBL species 0 $x 1 = 0$	
Sapling/Shrub Stratum (Plot size: 30' r	)			FACW species 0 x 2 = 0	
1. Cornus florida	10	Yes	FACU	FAC species 70 x 3 = 210	
2. Juniperus virginiana	10	Yes	FACU	FACU species 70 x 4 = 280	
3. Ligustrum sinense	10	Yes	FACU	UPL species 20 x 5 = 100	_
4.				Column Totals: 160 (A) 590	(B)
 5.				Prevalence Index = B/A = 3.69	_` ′
6.				Hydrophytic Vegetation Indicators:	_
7.				1 - Rapid Test for Hydrophytic Vegetation	
8.				2 - Dominance Test is >50%	
9.				3 - Prevalence Index is ≤3.0 <sup>1</sup>	
	30 :	=Total Cover		4 - Morphological Adaptations <sup>1</sup> (Provide supp	orting
			6	data in Remarks or on a separate sheet)	
50% of total cover:	15 20%	of total cover:	6		
	15 20%	of total cover:		Problematic Hydrophytic Vegetation <sup>1</sup> (Explain	n)
Herb Stratum (Plot size:15' r)				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain	<i>'</i>
Herb Stratum (Plot size: 15' r )  1. Toxicodendron radicans	20% 20 10	Yes	FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology m	<i>'</i>
Herb Stratum (Plot size: 15' r )  1. Toxicodendron radicans  2. Acer rubrum	20	Yes Yes	FAC FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology m present, unless disturbed or problematic.	
Herb Stratum (Plot size: 15' r )  1. Toxicodendron radicans  2. Acer rubrum  3. Liquidambar styraciflua	20	Yes	FAC FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology m present, unless disturbed or problematic.  Definitions of Four Vegetation Strata:	iust be
Herb Stratum (Plot size: 15' r )  1. Toxicodendron radicans  2. Acer rubrum  3. Liquidambar styraciflua  4. Quercus alba	20 10 10	Yes Yes Yes	FAC FAC FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology m present, unless disturbed or problematic.	cm) or
Herb Stratum (Plot size: 15' r )  1. Toxicodendron radicans  2. Acer rubrum  3. Liquidambar styraciflua  4. Quercus alba  5. Lonicera japonica	20 10 10 10	Yes Yes Yes Yes	FAC FAC	1 Indicators of hydric soil and wetland hydrology me present, unless disturbed or problematic.  Definitions of Four Vegetation Strata:  Tree – Woody plants, excluding vines, 3 in. (7.6 cm)	cm) or
Herb Stratum (Plot size: 15' r )  1. Toxicodendron radicans  2. Acer rubrum  3. Liquidambar styraciflua  4. Quercus alba  5. Lonicera japonica  6.	20 10 10 10	Yes Yes Yes Yes	FAC FAC FAC	1 Indicators of hydric soil and wetland hydrology meresent, unless disturbed or problematic.  Definitions of Four Vegetation Strata:  Tree – Woody plants, excluding vines, 3 in. (7.6 comore in diameter at breast height (DBH), regardle height.	cm) or
Herb Stratum (Plot size: 15' r )  1. Toxicodendron radicans  2. Acer rubrum  3. Liquidambar styraciflua  4. Quercus alba  5. Lonicera japonica  6. 7.	20 10 10 10	Yes Yes Yes Yes	FAC FAC FAC	Indicators of hydric soil and wetland hydrology meresent, unless disturbed or problematic.  Definitions of Four Vegetation Strata:  Tree – Woody plants, excluding vines, 3 in. (7.6 comore in diameter at breast height (DBH), regardless.	em) or ess of
Herb Stratum (Plot size: 15' r )  1. Toxicodendron radicans  2. Acer rubrum  3. Liquidambar styraciflua  4. Quercus alba  5. Lonicera japonica  6. 7. 8.	20 10 10 10	Yes Yes Yes Yes	FAC FAC FAC	1 Indicators of hydric soil and wetland hydrology mersent, unless disturbed or problematic.  Definitions of Four Vegetation Strata:  Tree – Woody plants, excluding vines, 3 in. (7.6 cmore in diameter at breast height (DBH), regardle height.  Sapling/Shrub – Woody plants, excluding vines,	em) or ess of
Herb Stratum (Plot size: 15' r )  1. Toxicodendron radicans  2. Acer rubrum  3. Liquidambar styraciflua  4. Quercus alba  5. Lonicera japonica  6. 7. 8. 9.	20 10 10 10	Yes Yes Yes Yes	FAC FAC FAC	Indicators of hydric soil and wetland hydrology mersent, unless disturbed or problematic.  Definitions of Four Vegetation Strata:  Tree – Woody plants, excluding vines, 3 in. (7.6 cmore in diameter at breast height (DBH), regardle height.  Sapling/Shrub – Woody plants, excluding vines, than 3 in. DBH and greater than or equal to 3.28 fm (1 m) tall.	cm) or ess of less
Herb Stratum (Plot size: 15' r )  1. Toxicodendron radicans  2. Acer rubrum  3. Liquidambar styraciflua  4. Quercus alba  5. Lonicera japonica  6. 7. 8. 9.	20 10 10 10	Yes Yes Yes Yes	FAC FAC FAC	Indicators of hydric soil and wetland hydrology mersent, unless disturbed or problematic.  Definitions of Four Vegetation Strata:  Tree – Woody plants, excluding vines, 3 in. (7.6 cmore in diameter at breast height (DBH), regardle height.  Sapling/Shrub – Woody plants, excluding vines, than 3 in. DBH and greater than or equal to 3.28 features.	cm) or ess of less
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Herb Stratum (Plot size: 15' r )  1. Toxicodendron radicans  2. Acer rubrum  3. Liquidambar styraciflua  4. Quercus alba  5. Lonicera japonica  6. 7. 8. 9. 10. 11.	20 10 10 10 10	Yes Yes Yes Yes Yes  Yes  Total Cover	FAC FAC FACU FACU	1 Indicators of hydric soil and wetland hydrology meresent, unless disturbed or problematic.  Definitions of Four Vegetation Strata:  Tree – Woody plants, excluding vines, 3 in. (7.6 cmore in diameter at breast height (DBH), regardle height.  Sapling/Shrub – Woody plants, excluding vines, than 3 in. DBH and greater than or equal to 3.28 fm (1 m) tall.  Herb – All herbaceous (non-woody) plants, regardle	cm) or ess of less
Herb Stratum (Plot size: 15' r )  1. Toxicodendron radicans  2. Acer rubrum  3. Liquidambar styraciflua  4. Quercus alba  5. Lonicera japonica  6. 7. 8. 9. 10. 11.	20 10 10 10 10	Yes Yes Yes Yes Yes	FAC FAC FACU FACU	Indicators of hydric soil and wetland hydrology mersent, unless disturbed or problematic.  Definitions of Four Vegetation Strata:  Tree – Woody plants, excluding vines, 3 in. (7.6 cmore in diameter at breast height (DBH), regardle height.  Sapling/Shrub – Woody plants, excluding vines, than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regard of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28	cm) or ess of less
Herb Stratum (Plot size: 15' r )  1. Toxicodendron radicans  2. Acer rubrum  3. Liquidambar styraciflua  4. Quercus alba  5. Lonicera japonica  6. 7. 8. 99. 110. 111. 50% of total cover:	20 10 10 10 10 10 60	Yes Yes Yes Yes Yes  Yes  Total Cover	FAC FAC FACU FACU	Indicators of hydric soil and wetland hydrology mersent, unless disturbed or problematic.  Definitions of Four Vegetation Strata:  Tree – Woody plants, excluding vines, 3 in. (7.6 cmore in diameter at breast height (DBH), regardle height.  Sapling/Shrub – Woody plants, excluding vines, than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regard of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28	cm) or ess of less
Herb Stratum (Plot size: 15' r )  1. Toxicodendron radicans  2. Acer rubrum  3. Liquidambar styraciflua  4. Quercus alba  5. Lonicera japonica  6. 7. 8. 9. 10. 11. 50% of total cover:	20 10 10 10 10 10 60	Yes Yes Yes Yes Yes  Yes  Total Cover	FAC FAC FACU FACU	Indicators of hydric soil and wetland hydrology mersent, unless disturbed or problematic.  Definitions of Four Vegetation Strata:  Tree – Woody plants, excluding vines, 3 in. (7.6 cmore in diameter at breast height (DBH), regardle height.  Sapling/Shrub – Woody plants, excluding vines, than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regard of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28	cm) or ess of less ft
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Herb Stratum (Plot size:	20 10 10 10 10 10 60	Yes Yes Yes Yes Yes  Yes  Total Cover	FAC FAC FACU FACU	Indicators of hydric soil and wetland hydrology mersent, unless disturbed or problematic.  Definitions of Four Vegetation Strata:  Tree – Woody plants, excluding vines, 3 in. (7.6 cmore in diameter at breast height (DBH), regardle height.  Sapling/Shrub – Woody plants, excluding vines, than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regard of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28	cm) or ess of less ft
Herb Stratum (Plot size: 15' r )  1. Toxicodendron radicans  2. Acer rubrum  3. Liquidambar styraciflua  4. Quercus alba  5. Lonicera japonica  6. 7. 8. 9. 10. 11. 50% of total cover: Woody Vine Stratum (Plot size: )  1. 2. 3. 4.	20 10 10 10 10 10 60	Yes Yes Yes Yes Yes  Yes  Total Cover	FAC FAC FACU FACU	Indicators of hydric soil and wetland hydrology mersent, unless disturbed or problematic.  Definitions of Four Vegetation Strata:  Tree – Woody plants, excluding vines, 3 in. (7.6 cmore in diameter at breast height (DBH), regardle height.  Sapling/Shrub – Woody plants, excluding vines, than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  Herb – All herbaceous (non-woody) plants, regard of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28	cm) or ess of less ft
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Sampling Point:

WWG-UP

SOIL Sampling Point: WWG-UP

	ription: (Describe t	o the dep				ator or co	onfirm the abs	sence of in	dicators.)	
Depth	Matrix			x Featur		12	T t		D	
(inches)	Color (moist)	<u>%</u>	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Rem	narks
0-12	10yr 4/4	100					Loamy/Clay	yey		
										_
<sup>1</sup> Type: C=Co	oncentration, D=Deple	etion. RM:	=Reduced Matrix. N	 IS=Mas	ked Sand	Grains	2	ocation: PI	=Pore Lining, N	/⊫Matrix
Hydric Soil I			Troudoud manny n			. 0				atic Hydric Soils <sup>3</sup> :
Histosol			Polyvalue Be	elow Su	rface (S8	(MLRA	147, 148)		Muck (A10) <b>(M</b>	-
	ipedon (A2)		Thin Dark Su			-	-		t Prairie Redox	•
Black His			Loamy Muck				-		.RA 147, 148)	,
	n Sulfide (A4)		Loamy Gleye	-			•	-	nont Floodplain	Soils (F19)
	Layers (A5)		Depleted Ma						RA 136, 147)	, ,
2 cm Mu	ck (A10) (LRR N)		Redox Dark	Surface	(F6)			Red F	Parent Material	(F21)
Depleted	Below Dark Surface	(A11)	Depleted Da	rk Surfa	ce (F7)			(ou	tside MLRA 12	27, 147, 148)
Thick Da	rk Surface (A12)		Redox Depre	essions	(F8)			Very :	Shallow Dark S	urface (F22)
Sandy M	ucky Mineral (S1)		Iron-Mangan	ese Ma	sses (F12	2) <b>(LRR N</b>	١,	Other	(Explain in Re	marks)
Sandy G	leyed Matrix (S4)		MLRA 136	•				_		
	edox (S5)		Umbric Surfa				-			vegetation and
	Matrix (S6)		Piedmont Flo				-			ust be present,
	face (S7)		Red Parent I	Material	(F21) <b>(M</b>	LRA 127	, 147, 148)	unles	s disturbed or p	oroblematic.
	.ayer (if observed):									
Type:										
Depth (in	iches):						Hydric Soi	I Present?	Yes	NoX
Remarks:										
	eet is revised from Ea	astern Mo	untains and Piedmo	nt Regi	onal Sup	plement \	Version 2.0 to	include the l	NRCS Field Inc	licators of Hydric
Soils, Version	16.0, 2016.									

Project/Site: C540	City/County: Wake		Sampling Date: 8/16/17
Applicant/Owner: NCDOT		State: NC	Sampling Point: WWH-WET
Investigator(s): V. Miller, J. Garvey	Section, Township, Range	:	
Landform (hillside, terrace, etc.): terrace	Local relief (concave, convex,	none): concave	Slope (%):2
Subregion (LRR or MLRA): LRR P, MLRA 136	Lat: 35.756933 Long:	-78.507844	Datum: NAD83
Soil Map Unit Name: WnA - Wehadkee silt loan		NWI classificat	tion: PFO
Are climatic / hydrologic conditions on the site type			explain in Remarks.)
Are Vegetation, Soil, or Hydrology	<del></del> -	Circumstances" present?	
Are Vegetation, Soil, or Hydrology	naturally problematic? (If needed, ex	plain any answers in Re	marks.)
SUMMARY OF FINDINGS – Attach sit	e map showing sampling point locati	ons, transects, im	portant features, etc.
Hydrophytic Vegetation Present? Yes Hydric Soil Present? Yes Wetland Hydrology Present? Yes	X No within a Wetland?	Yes X	No
Remarks:			
HYDROLOGY			
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required;  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)	check all that apply)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots (C3)  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C6)  Thin Muck Surface (C7)  Other (Explain in Remarks)	Surface Soil Crack Sparsely Vegetate X Drainage Patterns Moss Trim Lines ( Dry-Season Wate X Crayfish Burrows	ed Concave Surface (B8) s (B10) B16) r Table (C2) (C8) on Aerial Imagery (C9)
Iron Deposits (B5)	(	Geomorphic Posit	
Inundation Visible on Aerial Imagery (B7)		Shallow Aquitard (	(D3)
X Water-Stained Leaves (B9)		Microtopographic	, ,
Aquatic Fauna (B13)	1	X FAC-Neutral Test	(D5)
Water Table Present? Yes No Saturation Present? Yes No (includes capillary fringe)	b X Depth (inches): 0 Depth (inches): 0 Depth (inches): 0 Wetland ring well, aerial photos, previous inspections), if a	Hydrology Present?	Yes <u>X</u> No
Remarks:			

l re	Otractions (Distractions)	Absolute	Dominant	Indicator	Banda and Tast was desired
	e Stratum (Plot size:)	% Cover	Species?	Status	Dominance Test worksheet:
1.	Acer rubrum	70	Yes	FAC	Number of Dominant Species
2.					That Are OBL, FACW, or FAC:5(A)
3.					Total Number of Dominant
4.					Species Across All Strata: 7 (B)
5.					Percent of Dominant Species
6.					That Are OBL, FACW, or FAC: 71.4% (A/B)
7.					Prevalence Index worksheet:
		70 :	=Total Cover		Total % Cover of: Multiply by:
	50% of total cover: 35	20%	of total cover:	14	OBL species 5 x 1 = 5
Sap	oling/Shrub Stratum (Plot size:)				FACW species 0 x 2 = 0
1.	Ligustrum japonicum	40	Yes	UPL	FAC species 202 x 3 = 606
2.	Liquidambar styraciflua	10	No	FAC	FACU species12 x 4 =48
3.	Ulmus rubra	10	No	FAC	UPL species 50 x 5 = 250
4.					Column Totals: 269 (A) 909 (B)
5.					Prevalence Index = B/A = 3.38
6.					Hydrophytic Vegetation Indicators:
7.					1 - Rapid Test for Hydrophytic Vegetation
8.					X 2 - Dominance Test is >50%
9.					3 - Prevalence Index is ≤3.0 <sup>1</sup>
-		60 :	=Total Cover		4 - Morphological Adaptations <sup>1</sup> (Provide supporting
	50% of total cover: 30		of total cover:	12	data in Remarks or on a separate sheet)
Наі	rb Stratum (Plot size: )		or total cover.		Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
1.	Microstegium vimineum	60	Yes	FAC	1 <del>.                                      </del>
2.		40	Yes	FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
	Athyrium asplenioides	5			·
3.	Saururus cernuus		No No	OBL UPL	Definitions of Four Vegetation Strata:
4.	Ligustrum japonicum		No		<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of
5.	Rubus argutus	5	No	FACU	height.
6.					
7.					Sapling/Shrub – Woody plants, excluding vines, less
8.					than 3 in. DBH and greater than or equal to 3.28 ft
-					(1 m) tall
9.					(1 m) tall.
-					<b>Herb</b> – All herbaceous (non-woody) plants, regardless
9.					
9. 10.			=Total Cover		Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
9. 10.	50% of total cover:60		=Total Cover of total cover:	24	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
9. 10. 11.	50% of total cover: 60			24	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
9. 10. 11.				24 FACU	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
9. 10. 11.	ody Vine Stratum (Plot size:)	20%	of total cover:		Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
9. 10. 11. <u>Wo</u>	ody Vine Stratum (Plot size: )  Parthenocissus quinquefolia	20%	of total cover:	FACU	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
9. 10. 11. <u>Wo</u> 1. 2.	ody Vine Stratum (Plot size: )  Parthenocissus quinquefolia  Campsis radicans	2 2	of total cover:  No No	FACU FAC	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
9. 10. 11. Wo 1. 2. 3.	Pody Vine Stratum (Plot size:) Parthenocissus quinquefolia Campsis radicans Toxicodendron radicans	2 2 2 5	of total cover:  No No Yes	FACU FAC FAC	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.
9. 10. 11. Wo 1. 2. 3. 4.	pody Vine Stratum (Plot size:) Parthenocissus quinquefolia Campsis radicans Toxicodendron radicans Lonicera japonica	2 2 5 5 5 5 5	No No Yes Yes	FACU FAC FAC FACU	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic
9. 10. 11. Wo 1. 2. 3. 4.	pody Vine Stratum (Plot size:) Parthenocissus quinquefolia Campsis radicans Toxicodendron radicans Lonicera japonica	2 2 5 5 5 19 :	No No Yes Yes Yes	FACU FAC FAC FACU	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.
9. 10. 11. Wo 1. 2. 3. 4. 5.	Parthenocissus quinquefolia Campsis radicans Toxicodendron radicans Lonicera japonica Smilax rotundifolia 50% of total cover: 10	2 2 5 5 5 19 : 20%	No No Yes Yes Yes Total Cover	FACU FAC FAC FACU FAC	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic Vegetation
9. 10. 11. Wo 1. 2. 3. 4. 5.	Parthenocissus quinquefolia Campsis radicans Toxicodendron radicans Lonicera japonica Smilax rotundifolia	2 2 5 5 5 19 : 20%	No No Yes Yes Yes Total Cover	FACU FAC FAC FACU FAC	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic Vegetation
9. 10. 11. Wo 1. 2. 3. 4. 5.	Parthenocissus quinquefolia Campsis radicans Toxicodendron radicans Lonicera japonica Smilax rotundifolia 50% of total cover: 10	2 2 5 5 5 19 : 20%	No No Yes Yes Yes Total Cover	FACU FAC FAC FACU FAC	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic Vegetation
9. 10. 11. Wo 1. 2. 3. 4. 5.	Parthenocissus quinquefolia Campsis radicans Toxicodendron radicans Lonicera japonica Smilax rotundifolia 50% of total cover: 10	2 2 5 5 5 19 : 20%	No No Yes Yes Yes Total Cover	FACU FAC FAC FACU FAC	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic Vegetation
9. 10. 11. Wo 1. 2. 3. 4. 5.	Parthenocissus quinquefolia Campsis radicans Toxicodendron radicans Lonicera japonica Smilax rotundifolia 50% of total cover: 10	2 2 5 5 5 19 : 20%	No No Yes Yes Yes Total Cover	FACU FAC FAC FACU FAC	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic Vegetation

Sampling Point: WWH-WET

SOIL Sampling Point: WWH-WET

Profile Descr	ription: (Describe to	o the dept				tor or co	onfirm the absence	e of indicators.)			
Profile Description: (Describe to the de			Redox	Featur							
(inches)	Color (moist)	%	Color (moist)	<u>%</u>	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Remarks		
0-14	10yr 4/1	80	10yr 4/6	20	С	PL	Loamy/Clayey	Prominent	redox concentrations		
								_			
								_			
			_					-			
<sup>1</sup> Type: C=Co	ncentration, D=Deple	etion RM-I	Reduced Matrix M	S-Mas	ked Sand		<sup>2</sup> l ocatio	on: PL=Pore Lin	ing M-Matrix		
Hydric Soil In		Z. (O) 1, 1 (1VI—1	toddood Matrix, iv	O-Mas	Rea Garie	Ciaino.			blematic Hydric Soils <sup>3</sup> :		
Histosol (			Polyvalue Be	low Sur	face (S8)	(MLRA			0) <b>(MLRA 147)</b>		
	pedon (A2)		Thin Dark Su			-		Coast Prairie R			
Black His			Loamy Muck					(MLRA 147,			
Hydrogen	Sulfide (A4)		Loamy Gleye				-	•	dplain Soils (F19)		
Stratified	Layers (A5)		X Depleted Ma	rix (F3)				(MLRA 136,	147)		
2 cm Mud	ck (A10) (LRR N)		Redox Dark	Surface	(F6)			Red Parent Ma	terial (F21)		
Depleted	Below Dark Surface	(A11)	Depleted Dar	k Surfa	ce (F7)			(outside ML	RA 127, 147, 148)		
Thick Dar	k Surface (A12)		Redox Depre	ssions	(F8)			Very Shallow D	Park Surface (F22)		
	ucky Mineral (S1)		Iron-Mangan		sses (F12	2) <b>(LRR N</b>	I,	Other (Explain	in Remarks)		
	eyed Matrix (S4)		MLRA 136				3.				
Sandy Re			Umbric Surfa					-	phytic vegetation and		
	Matrix (S6)		Piedmont Flo					-	ogy must be present,		
Dark Surf			Red Parent N	/laterial	(F21) <b>(M</b>	LRA 127	, 147, 148)	unless disturbe	ed or problematic.		
	ayer (if observed):										
Type:	-1 \						Ukadala Oali Baa	10 V-	- V N-		
Depth (in	cnes):						Hydric Soil Pres	sent? Ye	s_X_ No		
Remarks:	at in revised from Fo	atara Maur	stains and Diadma	nt Dogi	anal Cun	alamant \	largian 2 0 to includ	do the NDCC Fie	ald Indicators of Lludria		
Soils, Version		stern wour	itains and Pledino	ni Kegi	onai Supi	olement v	version 2.0 to includ	ie trie inkos Fie	eld Indicators of Hydric		
, , , , , , , , , , , , , , , , , , , ,											

Project/Site: C540	City/County: Wake	Sampling Date: 8/16	5/17
Applicant/Owner: NCDOT		State: NC Sampling Point: WW	/I-WET
Investigator(s): V. Miller, J. Garvey	Section, Township, Range:		
Landform (hillside, terrace, etc.): terrace	Local relief (concave, convex, no	one): concave Slope (%):	1
Subregion (LRR or MLRA): LRR P, MLRA 136	Lat: 35.756135 Long: -78	5.507693 Datum: NAE	083
Soil Map Unit Name: WnA - Wehadkee silt loam		NWI classification: PFO	
Are climatic / hydrologic conditions on the site typ		No (If no, explain in Remarks.)	
Are Vegetation, Soil, or Hydrology		cumstances" present? Yes X No	
Are Vegetation, Soil, or Hydrology		nin any answers in Remarks.)	
<del></del>	e map showing sampling point location		etc.
Hydrophytic Vegetation Present? Yes Hydric Soil Present? Yes Wetland Hydrology Present? Yes	X No within a Wetland?	Yes X No	
HYDROLOGY			
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required;	·	Secondary Indicators (minimum of two requi	<u>red)</u>
Surface Water (A1)	True Aquatic Plants (B14)	Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (E	38)
X High Water Table (A2)	<del>-</del> · · · · · · · · · · - <del>-</del>	X Drainage Patterns (B10)	,0,
	<b>-</b>	X Moss Trim Lines (B16)	
X Water Marks (B1)	Presence of Reduced Iron (C4)	Dry-Season Water Table (C2)	
Sediment Deposits (B2)		X Crayfish Burrows (C8)	
Drift Deposits (B3)	Thin Muck Surface (C7)	Saturation Visible on Aerial Imagery (C9	))
Algal Mat or Crust (B4)	Other (Explain in Remarks)	Stunted or Stressed Plants (D1)	
Iron Deposits (B5)	<u>-</u>	Geomorphic Position (D2)	
Inundation Visible on Aerial Imagery (B7)	_	Shallow Aquitard (D3)	
X Water-Stained Leaves (B9)	_	Microtopographic Relief (D4)	
Aquatic Fauna (B13)		X FAC-Neutral Test (D5)	
Field Observations:			
Surface Water Present? Yes No	X Depth (inches): 0		
Water Table Present? Yes X No	Depth (inches): 6 Depth (inches): 6 Wetland Hy		
Saturation Present? Yes X No	Depth (inches): 6 Wetland Hy	rdrology Present? Yes X No	
(includes capillary fringe)	ring well, aerial photos, previous inspections), if ava	ilabla	
Describe Recorded Data (Stream gauge, monito	ing well, aerial priotos, previous inspections), il ava	iaute.	
Remarks:			
Nemans.			

Trac Charters (Diet sines 201 a. )	Absolute	Dominant Cresise?	Indicator	Daminanaa Taat wankahaat
Tree Stratum (Plot size: 30' r )	% Cover	Species?	Status	Dominance Test worksheet:
1. Acer rubrum	40	Yes	FAC	Number of Dominant Species
2. Liquidambar styraciflua	15	Yes	FAC	That Are OBL, FACW, or FAC:6 (A)
3. Ulmus rubra	15	Yes	FAC	Total Number of Dominant
4				Species Across All Strata: 7 (B)
5				Percent of Dominant Species
6.				That Are OBL, FACW, or FAC: 85.7% (A/B)
7.				Prevalence Index worksheet:
	70	=Total Cover		Total % Cover of: Multiply by:
50% of total cover:	35 20%	of total cover:	14	OBL species60 x 1 =60
Sapling/Shrub Stratum (Plot size: 30' r	)			FACW species 7 x 2 = 14
Ligustrum sinense	40	Yes	FACU	FAC species 135 x 3 = 405
2.				FACU species 40 x 4 = 160
3.				UPL species 0 x 5 = 0
4				Column Totals: 242 (A) 639 (B)
5.				Prevalence Index = B/A = 2.64
6.				Hydrophytic Vegetation Indicators:
7.				1 - Rapid Test for Hydrophytic Vegetation
8.				X 2 - Dominance Test is >50%
9.				X 3 - Prevalence Index is ≤3.0 <sup>1</sup>
	40	=Total Cover		4 - Morphological Adaptations <sup>1</sup> (Provide supporting
50% of total cover:		of total cover:	8	data in Remarks or on a separate sheet)
Herb Stratum (Plot size: 15' r )	20 20 70	or total cover.		Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
1. Saururus cernuus	60	Yes	OBL	
	50	Yes	FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
			FAC	·
3. Athyrium asplenioides	<u>10</u> 5	No No		Definitions of Four Vegetation Strata:
4. Lobelia cardinalis		No	FACW	<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of
5. Pilea pumila	2	No	FACW	height.
6.		-		
7				Sapling/Shrub – Woody plants, excluding vines, less
8				than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
9				
10				Herb – All herbaceous (non-woody) plants, regardless
11				of size, and woody plants less than 3.28 ft tall.
		=Total Cover		Woody Vine – All woody vines greater than 3.28 ft in
50% of total cover:	64 20%	of total cover:	26	height.
Woody Vine Stratum (Plot size: 30'r )				
Vitis rotundifolia	5	Yes	FAC	
2				
3				
4.				
5.				Hadran badla
	5	=Total Cover		Hydrophytic Vegetation
50% of total cover:	3 20%	of total cover:	1	Present? Yes X No
	-			
Remarks: (Include photo numbers here or on a sep	arate sneet.)			

Sampling Point: WWI-WET

SOIL Sampling Point: WWI-WET

Profile Desc	ription: (Describe t	o the de	oth needed to doc	ıment t	he indica	tor or co	onfirm the absence	of indicators.)					
Depth	Matrix		Redo	x Featu	es								
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks					
0-2	10yr 4/2	60	10yr 3/6	40	С	PL	Loamy/Clayey	Prominent redox concentrations					
2-12	10yr 5/1	60	10yr 4/6	40	<u>C</u>	PL	Loamy/Clayey	Prominent redox concentrations					
12-14	10yr 4/1	60	10yr 4/4	40	<u>C</u>	<u>PL</u>	Loamy/Clayey Distinct redox concentration						
<sup>1</sup> Type: C=Co	ncentration, D=Depl	etion, RM	=Reduced Matrix, N	 //S=Mas	ked Sand	Grains.	2Location	: PL=Pore Lining, M=Matrix.					
Hydric Soil I		,						ators for Problematic Hydric Soils <sup>3</sup> :					
Histosol			Polyvalue Be	elow Su	rface (S8)	(MLRA		2 cm Muck (A10) (MLRA 147)					
	ipedon (A2)		Thin Dark Su			-		Coast Prairie Redox (A16)					
Black His			Loamy Muck					(MLRA 147, 148)					
	n Sulfide (A4)		Loamy Gley	-				Piedmont Floodplain Soils (F19)					
	Layers (A5)		X Depleted Ma				<del></del> `	(MLRA 136, 147)					
	ck (A10) <b>(LRR N)</b>		Redox Dark				F	Red Parent Material (F21)					
	Below Dark Surface	(A11)	Depleted Da		. ,			(outside MLRA 127, 147, 148)					
Thick Da	rk Surface (A12)	,	Redox Depre	essions	(F8)		\	/ery Shallow Dark Surface (F22)					
	ucky Mineral (S1)		Iron-Mangar			2) <b>(LRR I</b>		Other (Explain in Remarks)					
	leyed Matrix (S4)		MLRA 136		,			, ,					
Sandy Re	edox (S5)		Umbric Surfa	ace (F13	3) <b>(MLRA</b>	122, 130	3Indio	cators of hydrophytic vegetation and					
Stripped	Matrix (S6)		Piedmont Fl	oodplair	Soils (F	19) <b>(MLR</b>	<b>A 148)</b> v	vetland hydrology must be present,					
Dark Sur	face (S7)		Red Parent I	Material	(F21) <b>(M</b>	LRA 127	, <b>147, 148)</b>	ınless disturbed or problematic.					
Restrictive L	.ayer (if observed):		_ <del></del>										
Type:													
Depth (in	ches):						Hydric Soil Prese	nt? Yes_X_ No					
Remarks:	not in ravisad from Ea	actorn Mo	untains and Diadma	nt Bogi	anal Sun	olomont \	Varaion 2.0 to include	the NBCS Field Indicators of Hydric					
Soils, Versior		astern ivio	untains and Pleding	nı Kegi	onai Supi	Siement	version 2.0 to include	the NRCS Field Indicators of Hydric					

Project/Site: C540	City/County: Wake	Sampling Date	e: 8/16/17
Applicant/Owner: NCDOT		State: NC Sampling Poir	nt: wwn/wwi-up
Investigator(s): V. Miller, J. Garvey	Section, Township, Range	:	
Landform (hillside, terrace, etc.):	Local relief (concave, convex	none): Slope (%	):5
Subregion (LRR or MLRA): LRR P, MLRA 1	36 Lat: 35.756601 Long:	78.50775 Datum:	NAD83
Soil Map Unit Name: WnA - Wehadkee silt I	oam, 0 to 2 percent slopes, frequently flooded	NWI classification: UPL	
Are climatic / hydrologic conditions on the site	e typical for this time of year? Yes X	No (If no, explain in Rema	rks.)
Are Vegetation, Soil, or Hydro		Circumstances" present? Yes X	
Are Vegetation, Soil, or Hydro		plain any answers in Remarks.)	
	site map showing sampling point locat	,	ures, etc.
Hydrophytic Vegetation Present?	Yes X No Is the Sampled Area		
Hydric Soil Present?	Yes No X within a Wetland?	Yes No _X	
Wetland Hydrology Present?	Yes No _X		
Remarks:			
HYDROLOGY			
Wetland Hydrology Indicators:		Secondary Indicators (minimum of tw	o required)
Primary Indicators (minimum of one is requi		Surface Soil Cracks (B6)	
Surface Water (A1)	True Aquatic Plants (B14)	Sparsely Vegetated Concave Sur	face (B8)
High Water Table (A2)	Hydrogen Sulfide Odor (C1)	Drainage Patterns (B10)	
Saturation (A3)	Oxidized Rhizospheres on Living Roots (C3)	Moss Trim Lines (B16)	
Water Marks (B1) Sediment Deposits (B2)	Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C6)	Dry-Season Water Table (C2) Crayfish Burrows (C8)	
Drift Deposits (B3)	Thin Muck Surface (C7)	Saturation Visible on Aerial Imag	ary (CQ)
Algal Mat or Crust (B4)	Other (Explain in Remarks)	Stunted or Stressed Plants (D1)	ery (Ce)
Iron Deposits (B5)	Culci (Explain in Normano)	Geomorphic Position (D2)	
Inundation Visible on Aerial Imagery (B7	<b>'</b> )	Shallow Aquitard (D3)	
Water-Stained Leaves (B9)	,	Microtopographic Relief (D4)	
Aquatic Fauna (B13)		FAC-Neutral Test (D5)	
Field Observations:		<del></del>	
Surface Water Present? Yes	No X Depth (inches): 0		
Water Table Present? Yes	No X Depth (inches): 0		
Saturation Present? Yes	No X Depth (inches): 0 Wetland	Hydrology Present? Yes	NoX
(includes capillary fringe)			
Describe Recorded Data (stream gauge, mo	nitoring well, aerial photos, previous inspections), if a	vailable:	
Remarks:			
Nomano.			

T 0: (D) : 1 00! )	Absolute	Dominant	Indicator	
Tree Stratum (Plot size: 30' r )	% Cover	Species?	Status	Dominance Test worksheet:
1. <u>Ilex opaca</u>	20	Yes	FACU	Number of Dominant Species
2. Betula nigra	20	Yes	FACW	That Are OBL, FACW, or FAC:6 (A)
3. Quercus alba	20	Yes	FACU	Total Number of Dominant
4. Quercus nigra	20	Yes	FAC	Species Across All Strata: 9 (B)
5				Percent of Dominant Species
6.				That Are OBL, FACW, or FAC: 66.7% (A/B)
7.				Prevalence Index worksheet:
	80 :	=Total Cover		Total % Cover of: Multiply by:
50% of total cover:4	0 20%	of total cover:	16	OBL species 0 x 1 = 0
Sapling/Shrub Stratum (Plot size: 30' r )				FACW species 20 x 2 = 40
1. Ligustrum sinense	20	Yes	FACU	FAC species 120 x 3 = 360
2. Liquidambar styraciflua	5	No	FAC	FACU species 75 x 4 = 300
3. Rubus argutus	5	No	FACU	UPL species 0 x 5 = 0
4.				Column Totals: 215 (A) 700 (B)
5.				Prevalence Index = B/A = 3.26
6.				Hydrophytic Vegetation Indicators:
7.				1 - Rapid Test for Hydrophytic Vegetation
8.				X 2 - Dominance Test is >50%
9.				3 - Prevalence Index is ≤3.0 <sup>1</sup>
9.		Total Cours		l —
500/ / / /		=Total Cover	•	4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
	5 20%	of total cover:	6	
Herb Stratum (Plot size: 15' r )				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
1. Vitis rotundifolia	40	Yes	FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be
2. Microstegium vimineum	40	Yes	FAC	present, unless disturbed or problematic.
3. Toxicodendron radicans	5	No	FAC	Definitions of Four Vegetation Strata:
4. Lonicera japonica	5	No	FACU	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
5. Rubus argutus	5	No	FACU	more in diameter at breast height (DBH), regardless of
6.				height.
7				Sapling/Shrub – Woody plants, excluding vines, less
				than 3 in. DBH and greater than or equal to 3.28 ft
8.				
8. 9.				(1 m) tall.
				, ,
9				(1 m) tall. <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
9.	95	=Total Cover		Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
9. 10. 11.		=Total Cover	19	Herb – All herbaceous (non-woody) plants, regardless
9		=Total Cover of total cover:	19	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
9. 10. 11. 50% of total cover: 4 Woody Vine Stratum (Plot size: 30' r )	8 20%	of total cover:		Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
9	8 20% 5	of total cover:	FAC	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
9	8 20%	of total cover:		Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
9.  10.  11.  50% of total cover: 4  Woody Vine Stratum (Plot size: 30' r )  1. Vitis rotundifolia  2. Smilax rotundifolia  3.	8 20% 5	of total cover:	FAC	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
9.  10.  11.  50% of total cover: 4  Woody Vine Stratum (Plot size: 30' r )  1. Vitis rotundifolia 2. Smilax rotundifolia 3. 4.	8 20% 5	of total cover:	FAC	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
9.  10.  11.  50% of total cover: 4  Woody Vine Stratum (Plot size: 30' r )  1. Vitis rotundifolia  2. Smilax rotundifolia  3.	8 20% 5 5	of total cover:  Yes Yes	FAC	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in
9. 10. 11.  50% of total cover: 4  Woody Vine Stratum (Plot size: 30' r )  1. Vitis rotundifolia 2. Smilax rotundifolia 3. 4. 5.	8 20% 5 5 10	Yes Yes Yes Total Cover	FAC FAC	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic Vegetation
9. 10. 11.  50% of total cover: 4  Woody Vine Stratum (Plot size: 30' r )  1. Vitis rotundifolia 2. Smilax rotundifolia 3. 4. 5.	8 20% 5 5 10	of total cover:  Yes Yes	FAC	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic
9. 10. 11.  50% of total cover: 4  Woody Vine Stratum (Plot size: 30' r )  1. Vitis rotundifolia 2. Smilax rotundifolia 3. 4. 5.	5 5 5 10 5 20%	Yes Yes Yes Total Cover	FAC FAC	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  Woody Vine – All woody vines greater than 3.28 ft in height.  Hydrophytic Vegetation

Sampling Point: WWH/WWI-UP

SOIL Sampling Point: VWH/WWI-U

Profile Desc	ription: (Describe t	o the dept	h needed to doc	ument tl	he indica	ator or co	onfirm the abs	ence of indic	ators.)		
Depth	Matrix		Redo	x Featur	es						
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Rem	narks	
0-6	10yr 4/3	100					Sandy				
6-14	10yr 6/4	100					Sandy				
			_								
<sup>1</sup> Type: C=Co	oncentration, D=Depl	etion RM=	Reduced Matrix N	MS=Mas	ked Sand	Grains	<sup>2</sup> l o	cation: PL=P	ore Lining N	/⊫Matrix	
Hydric Soil I		otion, rtivi=	reduced Wath, N	io-iviao	noa oane	oranio.		Indicators f			c Soils <sup>3</sup> :
Histosol			Polyvalue Be	elow Sur	face (S8)	(MLRA	147, 148)		uck (A10) <b>(M</b>	-	
Histic Ep	pipedon (A2)		Thin Dark Su	urface (S	9) <b>(MLR</b>	A 147, 14	18)	Coast P	rairie Redox	(A16)	
Black His	stic (A3)		Loamy Muck	y Miner	al (F1) <b>(N</b>	ILRA 136	5)	(MLR	A 147, 148)		
Hydroge	n Sulfide (A4)		Loamy Gleye	ed Matri	x (F2)			Piedmoi	nt Floodplain	Soils (F1	9)
Stratified	Layers (A5)		Depleted Ma	trix (F3)				(MLR	A 136, 147)		
	ck (A10) <b>(LRR N)</b>		Redox Dark						ent Material		
	Below Dark Surface	(A11)	Depleted Da					-	de MLRA 12		-
	rk Surface (A12)		Redox Depre						allow Dark S		22)
	lucky Mineral (S1) leyed Matrix (S4)		Iron-Mangar		sses (F12	2) (LKK N	l,	Other (E	xplain in Re	marks)	
	edox (S5)		Umbric Surfa	-	R) (MI RA	122 136	:)	<sup>3</sup> Indicators o	f hydronhytic	venetatio	n and
	Matrix (S6)		Piedmont Flo				-		hydrology m	-	
	face (S7)		Red Parent I				-		listurbed or p		
	_ayer (if observed):				. , .				<u> </u>		
Type:	,										
Depth (in	nches):						Hydric Soil	Present?	Yes	No_	X
Remarks:	-										
	eet is revised from Ea	astern Mou	ntains and Piedmo	ont Regio	onal Sup	plement \	ersion 2.0 to ir	nclude the NR	CS Field Inc	dicators of	Hydric
Soils, Version	n 8.0, 2016.										